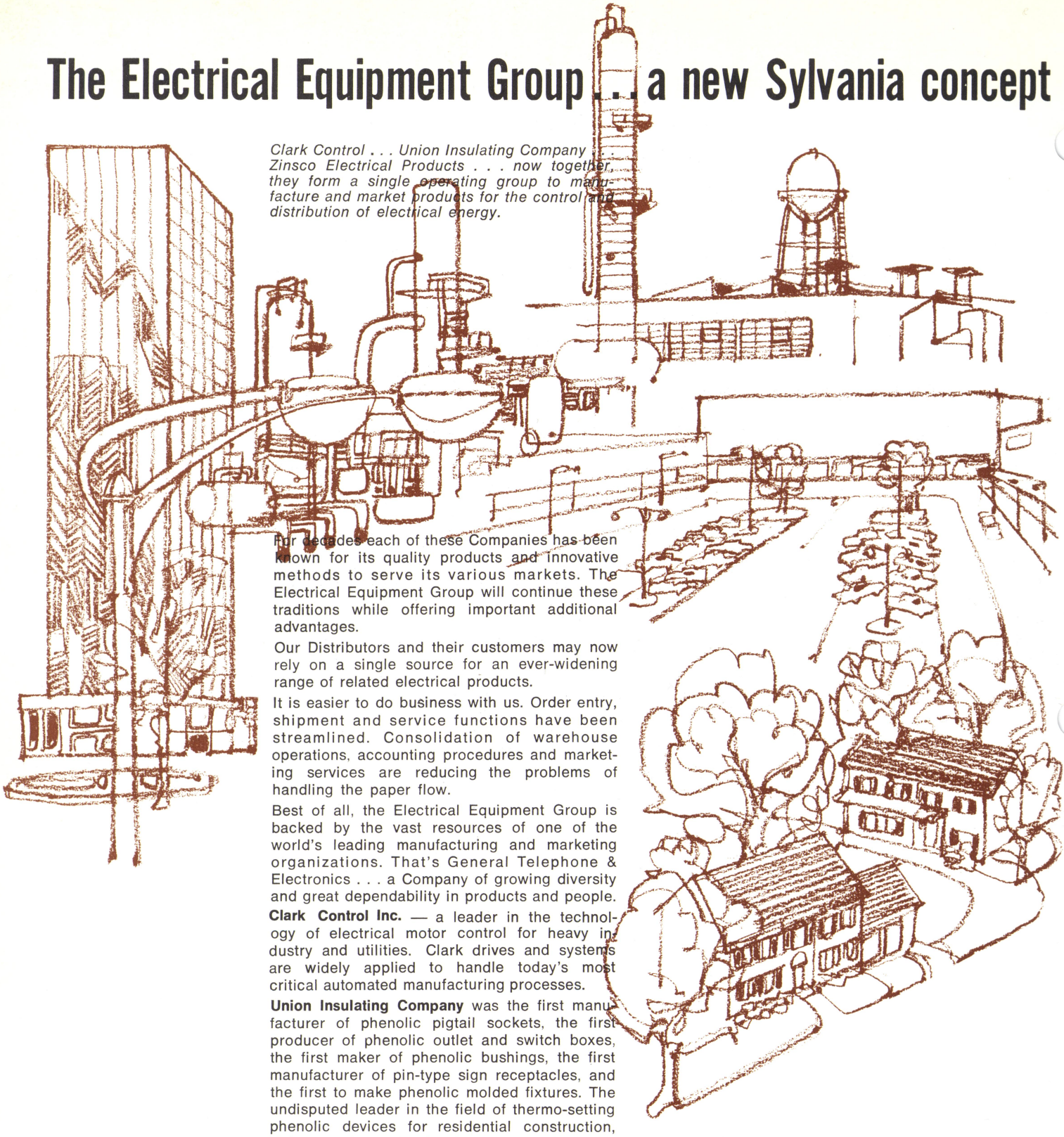
ENGINEERED PRODUCTS DIGEST

FEBRUARY 1976

SYLVANIA ELECTRICAL EQUIPMENT GROUP

The Electrical Equipment Group . . . a new Sylvania concept



Clark Control . . . Union Insulating Company . . . Zinsco Electrical Products . . . now together, they form a single operating group to manufacture and market products for the control and distribution of electrical energy.

For decades each of these Companies has been known for its quality products and innovative methods to serve its various markets. The Electrical Equipment Group will continue these traditions while offering important additional advantages.

Our Distributors and their customers may now rely on a single source for an ever-widening range of related electrical products.

It is easier to do business with us. Order entry, shipment and service functions have been streamlined. Consolidation of warehouse operations, accounting procedures and marketing services are reducing the problems of handling the paper flow.

Best of all, the Electrical Equipment Group is backed by the vast resources of one of the world's leading manufacturing and marketing organizations. That's General Telephone & Electronics . . . a Company of growing diversity and great dependability in products and people.

Clark Control Inc. — a leader in the technology of electrical motor control for heavy industry and utilities. Clark drives and systems are widely applied to handle today's most critical automated manufacturing processes.

Union Insulating Company was the first manufacturer of phenolic pigtail sockets, the first producer of phenolic outlet and switch boxes, the first maker of phenolic bushings, the first manufacturer of pin-type sign receptacles, and the first to make phenolic molded fixtures. The undisputed leader in the field of thermo-setting phenolic devices for residential construction, Union continues to develop new products for the market.

Zinsco Electrical Products provides products for both the industrial and the residential markets. Long known as an innovator, Zinsco looks forward to the introduction of more new products to answer needs in all areas. An impressive list of "firsts" include the first plug-on circuit breaker line . . . the first 225A plug-on molded case breaker . . . and the first color-coded breaker handles. Also included are many of the still-exclusive designs in metering panels and switchboards. The new Type HDMB Load Center, first to permit up to 600 amp. Main Breakers **to be field installed,** is another example of the continued innovation going ahead under the Electrical Equipment Group banner.

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PANELBOARDS AND SWITCHBOARDS

All products in this Digest are listed by Underwriters Laboratories Inc.

LIGHTING PANELBOARD

This panelboard is used for current distribution to lighting and appliance circuits, breaker equipped, it will not exceed 42 breaker poles, with more than 10% of its circuits rated 30 amperes or less.

DISTRIBUTION PANELBOARD

Used for power distribution to motor circuits, power circuits, lighting panelboards and power panelboards. Available with main lugs to 1200 amps, main fusible switch to 600 amps or main breaker to 1200 amps, at 600 volts AC.

MOTOR CONTROL PANELBOARD

A panelboard that will hold motor starter combinations, circuit breaker branch feeders and fusible switch branch feeders combining a complete power distribution system in one convenient enclosure.

UNI-FORMED SWITCHBOARDS

Sylvania Uni-formed deadfront switchboards have no exposed live parts on the front and consist of one or more vertical free-standing sections in which are mounted switching, measuring, circuit control and/or protective devices. Each structure is a 90 inch tall completely welded cubicle. Multiple sections are interconnected with constant positioned horizontal bus bar. Ratings to 600 volts, 4000 amps.

PANELBOARDS

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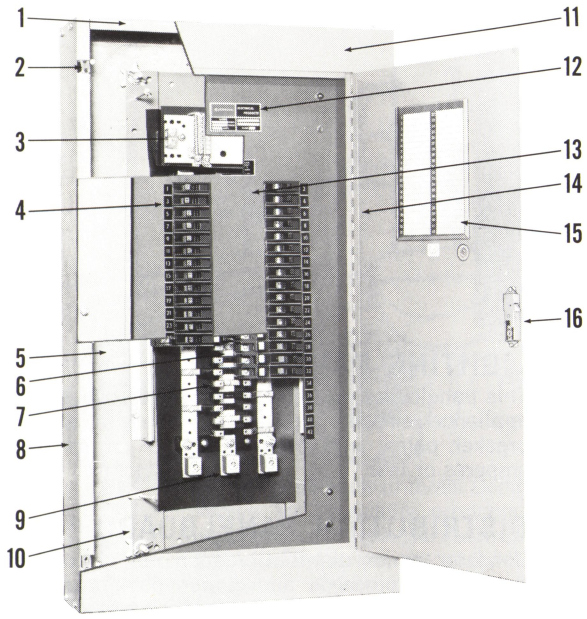
QUALITY DESIGN FEATURES



1 One end filled with knockouts. It can be removed and used as a template for conduit stubbing pattern. Other end blank.

2 Adjustable, swivel type trim clamps simplify installation of front and assure proper alignment of trim and door even when box is out of "plumb."

3 Solid neutral bar lugs will take #14 to #4 copper or aluminum wire. Arrangement of lugs provides maximum accessibility for easy wiring.

4 Circuit numbers legible and attractive . . . co-ordinate branch circuit identification with directory card.

5 Side gutters exceed code requirements in width permitting faster, easier branch wiring.

6 Sequence bus phasing simplifies balancing of loads.

7 Branch bus jumpers formed of tin plated copper and matched with main bus bars to assure exact alignment of circuit breaker line terminals.

8 Flanged-front box formed of code gauge galvanized sheet steel for maximum resistance to rust. Side and end gutters meet or exceed code requirements in width permitting faster wiring.

9 Mains: Either solderless lugs or molded case circuit breaker . . . both approved for copper or aluminum wire.

10 Leveling washers adjust positioning of panel interior for alignment and to match thickness of plaster wall.

11 Trim and door fabricated of 12 gauge (minimum) sheet steel, phosphatize coated, for permanent paint adherence, then enameled and baked for a truly durable finish.

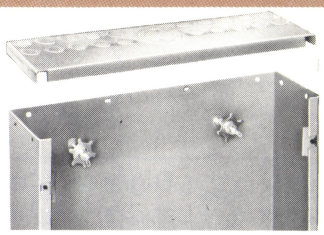
12 U.L. rating label indicates volts, amps and phase.

13 Dead-front permits access to wiring gutters (when front is removed) yet completely covers all live parts.

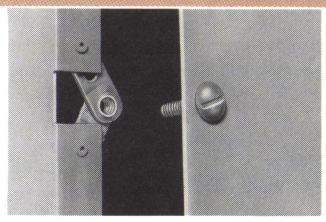
14 Full length piano hinge increases rigidity and adds to strength and attractive appearance of door.

15 Directory card for branch circuit identification.

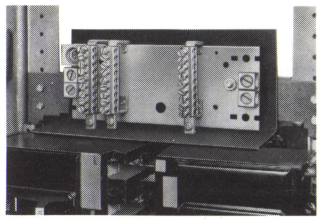
16 Doors fitted with flush type combination catch and lock. Doors over 48″ high fitted with 2 flush type locks. Two keys furnished with each lock.



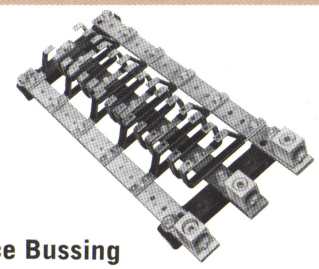
1 Removable Box Ends



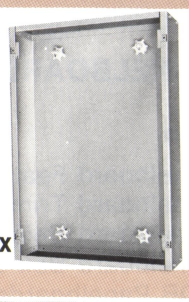
2 Adjustable Trim Clamps



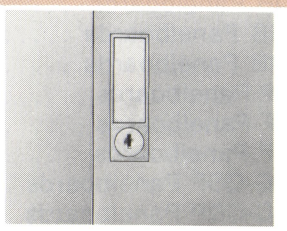
3 Cu/Al Neutral Bar



6 Sequence Bussing



8 Galvanized Steel Box



16 Catch & Lock

Sylvania Panelboards are listed by Underwriter's Laboratories, Inc.

PANELBOARD DESIGN

Sylvania Panelboards are manufactured in accordance with National Electric Code, Underwriters' Laboratories, Inc. and NEMA Standards and to meet Federal Specifications W-P-115a for Panelboards.

This line of panelboards has been designed for easy installation, reliable performance, safe operation, and simplified maintenance and has been engineered for commercial, industrial, institutional and residential applications.

PANELBOARD TYPES

LIGHTING PANELBOARDS:

A lighting and appliance panelboard is used to distribute current to lighting and appliance branch circuits. More than 10% of its circuit breakers must be rated at 30 amperes or less, for which neutral connections are provided. The panel is limited by NEC and UL Standards to 42 overcurrent devices (other than the mains) in one cabinet. Each breaker pole is considered one overcurrent device. When more than 42 overcurrent devices are required, one or more additional cabinets must be used.

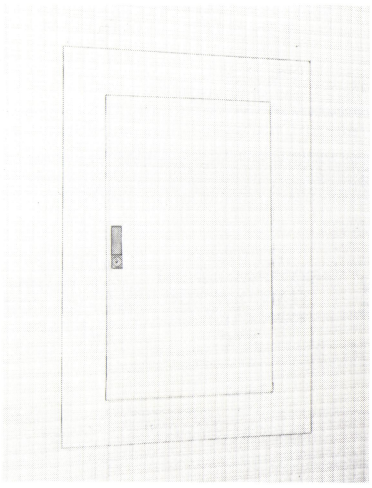
Where remote control of special equipment is desired, relays, contactors, time switches, etc. can be installed in a compartment of the lighting panelboard cabinet.

DISTRIBUTION PANELBOARDS:

Available with main lugs thru 1200 amperes; main and branch breakers thru 1200 amperes; main and branch fusible switches thru 600 amperes; and motor starters thru Size 4. Sylvania Distribution Panelboards offer a new degree of flexibility and convertibility never before available. Circuit breakers, fusible switches and motor starter cells can be combined and interchanged in the same enclosure.

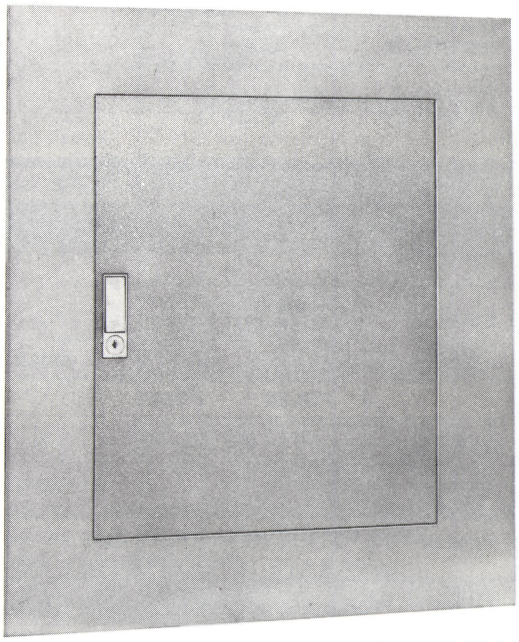
Distribution panelboards are not subject to the lighting panelboard rule of 42 overcurrent protective device limitation. Branch circuits are limited only by the capacity of the panel enclosure. When the number of devices needed exceeds the capacity of the cabinet, one or more additional cabinets should be used.

SPECIAL FEATURES — UNI-FLAT FRONT



EASY TO HIDE

EASY TO INSTALL



UNI-FLAT FRONT

Modern Interiors today require the smooth clean design of Sylvania's Uni-Flat Fronts. Made to blend in with today's modern decor. Quiet and unobtrusive . . . no exposed hinges, screw heads, or fasteners to mar its clean lines. We've even installed a tamper-proof, recessed lock with integral handle pull. UNI-FLAT FRONT mounts flush to wall surface.

UNI-FLAT FRONT is available in a full range of sizes to fit both surface and flush type panelboards. Standard ANSI 49 gray finish can be painted or wallpapered to match surrounding wall surface to make it even more unobtrusive.

One man can easily handle and install any size UNI-FLAT FRONT. A full-width top and bottom locating flange positions front on box. Self-adjusting trim clamps adjust to ⅝″ deep recessed box flange. No springs, cams or sliding mechanisms to jam up. A simple, single screw adjusts and tightens each clamp.

UNI-FLAT FRONT is available as an optional panelboard feature — refer to pages 18 and 19 for ordering information and other optional accessories.

LIGHTING & DISTRIBUTION PANELBOARDS
SELECTOR

PANELBOARD SELECTION

TYPE	SERVICE VOLTAGE	MAX. MAINS RATING			MAX. BRANCH RATING		PAGE NO.
		LUGS AMPERES	MAIN DISCONNECT AMPERES	MAIN DISCONNECT TYPE	AMPERES	TYPE	
CIRCUIT BREAKER LIGHTING PANELBOARDS							
NQB	120/240 A.C. 120/208 A.C. 240 A.C.	400	400	QB, QFB, & JL	100	QB	8
NA1B	120/240 A.C. 120/208 A.C. 240 A.C. 125/250 D.C.	400	400	E,EF,HEF FJ,HFJ JL,HJL	100	E	9
NH1B	277/480 A.C.	400	400	EF,HEF FJ,HFJ JL,HJL	100	EF	10
DISTRIBUTION PANELBOARDS							
NDP	480 A.C. 250 D.C.	400	400	QB,E,EF HEF,QFB FJ,HFJ JL,HJL	100	QB,E,EF HEF	11
QSF	600 A.C.	1200	600	QSFM	600	QSF	12
CDP	600 A.C. 250 D.C.	1200	1200	E,EF,HEF FJ,HFJ FK,JL,HJL JK,M,N,HN	1200	E,EF,HEF FJ,HFJ FK,JL,HJL JK,M,N,HN	14
MOTOR CONTROL PANELBOARDS							
CMC-QSF	600 A.C.	1200	600	QSF	600	QSF	16
CMC-CDP	600 A.C.	1200	1200	E,EF,HEF FJ,HFJ FK,JL,HJL JK,M,N,HN	1200	E,EF,HEF FJ,HFJ FK,JL,HJL JK,M,N,HN	16

Types CMC-QSF & CMC-CDP Panelboards not listed by U.L.

For Circuit Breaker Characteristics See Page 43

CATALOG NO. COMPOSITION FOR PANELBOARD TYPES: NQB, NA1B & NH1B

①	②	③				④	⑤	⑥
TYPE	BRANCH CIRCUITS (USE ONLY ONE)	MAINS (USE ONLY ONE)				MAIN AMPS	SEPARATE COMPARTMENT TIME SWITCH CONTACTOR, ETC.	ADD "F" FOR FLUSH OR "S" FOR SURFACE
	TOTAL BRANCH POLES / IF REQ. SPLIT BUS POLES	MAIN LUGS ONLY		MAIN BREAKER				
		1∅	3∅	1∅	3∅			
NA1B	30 OR 18-12	3L	4L	3AB	4AB	10	18C	F

EXAMPLES	CATALOG NO.
NA1B: 30 POLES; 18-12 SPLIT BUS 3∅ 4W 100A MAIN LUGS ONLY; SEPARATE 18" CONTACTOR COMPARTMENT, FLUSH MOUNTING.	NA1B18-12-4L10-18C-F
NQB: 42 POLES; 3∅ 4W 225A MAIN CIRCUIT BKR, SURFACE MOUNTING.	NQB42-4AB22-S

ORDERING DATA

① Specify panelboard and voltage.
② Specify number of branch poles or split bus, as required.
③ Specify main lugs only or main circuit breaker.
④ Specify main amps.—first two digits only—example: 225 = 22.
⑤ Specify separate compartment if required.
⑥ Add suffix "F" for flush cabinet or "S" for surface cabinet.

NOTE: Specify main at top or bottom.

BASE PRICE + BRANCH BREAKERS + MODIFICATIONS = LIST PRICE

UQB24-4L40F 120/208V, 30, 4W

20A-1P	20A-1P
30A-1P	30A-1P
20A-2P	20A-2P
30A-2P	30A-2P
30A-3P	30A-3P
40A-3P	40A-3P
400A MAIN LUGS ONLY	

	LIST PRICE
2-20A, 1P QB	$ 20
2-30A, 1P QB	20
2-20A, 2P QB	40
2-30A, 2P QB	40
2-30A, 3P QB	98
2-40A, 3P QB	98
1-BASE, 400A MAIN LUGS ONLY	219
TOTAL LIST PRICE	$535

LISTED BY UNDERWRITERS' LABORATORIES, INC.

TYPICAL LIGHTING PANELBOARD CONFIGURATIONS

NEMA 1 ENCLOSURES 20″ W x 5¾″ D — DESCRIPTION	WIRING DIAGRAM SEE PG. 11 SECT. 109 IN ENGR. MANUAL	BOX CATALOG NO. (See Notes Below) — BRANCH POLES (EXCLUDING SPLIT BUS POLES)					
		NQB			NA1B & NH1B		
		2-20	22-30	32-42	2-20	22-30	32-42
100 & 225 AMP MAIN LUGS ONLY							
MLO	1	TF23 ④	TF29 ④	TF35 ④	TF29	TF41	TF47
MLO & 18″C	2	TF41	TF47	TF53	TF47	TF59	TF65
MLO & 24″C	2	TF47	TF53	TF59	TF53	TF65	⑤TF29/47
MLO & Split Bus 12 Poles ①	3	TF35	...	...	TF47	...	...
MLO & Split Bus 12 Poles ②	3	...	TF41	...	...	TF59	...
MLO & Split Bus 12 Poles ③	3	...	...	TF47	...	...	TF65
MLO, Split Bus 12 Poles & 18″C ①	4	TF53	...	...	TF65	...	...
MLO, Split Bus 12 Poles & 18″C ②	4	...	TF59	...	...	⑤TF23/59	...
MLO, Split Bus 12 Poles & 18″C ③	4	...	...	TF65	...	...	(2)TF47
225 AMP MAIN LUGS ONLY & SUB-FEED							
MLO & 225A Sub Lugs	5	TF29	TF35	TF41	TF35	TF41	TF53
MLO & 225A Sub C/B	6	TF41	TF47	TF53	TF47	TF59	TF65
400 AMP MAIN LUGS ONLY							
MLO	1	...	TF35	TF41	...	TF47	TF53
MLO & 18″C	2	...	TF53	TF59	...	TF65	⑤TF23/53
MLO & 24″C	2	...	TF59	TF65	...	⑤TF29/47	⑤TF29/53
MLO & 225A Sub C/B	6	...	TF53	TF59	...	⑤TF23/53	⑤TF23/53
100 AMP MAIN CIRCUIT BREAKER (Bottom Feed — Consult Factory for Top Feed)							
MCB	7	TF29	TF35	TF41	TF41	TF53	TF65
MCB & 18″C	8	TF47	TF53	TF59	TF59	⑤TF23/53	(2)TF47
MCB & 24″C	8	TF53	TF59	TF65	TF65	⑤TF29/53	(2)TF47
MCB & Split Bus 12 Poles ①	9	TF41	...	...	TF59	...	...
MCB & Split Bus 12 Poles ②	9	...	TF47	...	...	TF65	...
MCB, Split Bus 12 Pole & 18″C ①	10	TF59	...	...	⑤TF23/59	...	...
MCB, Split Bus 12 Pole & 18″C ②	10	...	TF65	...	...	(2)TF53	...
MCB & 100A Sub Lugs	11	TF35	TF41	TF47	TF47	TF59	TF65
225 AMP MAIN CIRCUIT BREAKER (Bottom Feed — Consult Factory for Top Feed)							
MCB	7	TF29	TF35	TF41	TF41	TF53	TF65
MCB & 18″C	8	TF47	TF53	TF59	TF59	⑤TF23/53	(2)TF47
MCB & Split Bus 12 Poles ①	9	TF41	...	...	TF59	...	...
MCB & Split Bus 12 Poles ②	9	...	TF47	...	...	⑤TF59/23	...
MCB & Split Bus 12 Poles ③	9	...	...	TF53	...	...	(2)TF47
MCB, Split Bus 12 Poles & 18″C ①	10	TF59	...	...	⑤TF23/59	...	...
MCB, Split Bus 12 Poles & 18″C ②	10	...	TF65	...	...	(2)TF53	...
MCB, Split Bus 12 Poles & 18″C ③	10	...	...	⑤TF23/53	...	...	(2)TF65
MCB & 225A Sub Lugs	11	TF35	TF41	TF47	TF47	TF59	TF65
MCB & 225A Sub Circuit Breaker	12	TF41	TF47	TF53	TF47	TF59	TF65
400 AMP MAIN CIRCUIT BREAKER							
MCB	7	...	TF53	TF59	...	TF65	⑤TF23/53
MCB & 18″C	8	...	⑤TF23/53	⑤TF23/59	...	(2)TF47	(2)TF53
MCB, & 24″C	8	...	⑤TF29/53	(2)TF47	...	(2)TF53	(2)TF53

① Split bus 2 to 12 poles, constant bus 2 to 20 poles.
② Split bus 2 to 12 poles, constant bus 2 to 30 poles.
③ Split bus 2 to 12 poles, constant bus 2 to 40 poles (42 poles max).
④ Also available in 4½″ depth on special order.

MAIN LUGS WIRE CAPACITY — CU/AL

AMPERE RATING	AWG. MIN.	AWG. MAX.
100	#14	#1/0
225	#1	300MCM
400	(2)#2	(2)600MCM

MAIN BREAKER SELECTOR

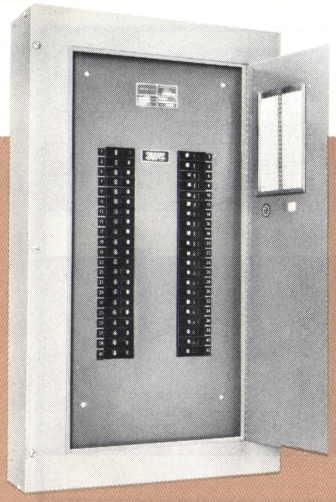
AMPERE RATING	NQB	NA1B	NH1B
100	QB	E	EF
225	QFB	FJ	FJ
400	JL	JL	JL

MLO = MAIN LUGS ONLY
MCB = MAIN CIRCUIT BREAKER
C = COMPARTMENT

AVAILABLE SPACE FOR DEVICES FOR CONTACTOR, RELAY, TIME SWITCH, ETC.

COMPARTMENT HEIGHT	WIDE	HIGH	DEEP
18″	12″	13″	4½″
24″	12″	19″	4½″

⑤ Minimum sizing of two cans mounted one above another; if side by side two identical size cans will be used at a height of 6-12″ smaller than the largest can shown . . . check with factory for exact dimensions.



TYPE NQB

TYPE NQB

TO 400 AMPERE MAINS

SERVICE:
1Ø 3W, 120/240V A.C.
1Ø 2W, 240V A.C.
3Ø 4W, 120/208V A.C.
3Ø 3W, 240V A.C.
3Ø 4W, 277/480V A.C.

BOLT-ON BRANCHES:
QB LINE
15-70A-#4 Cu or Al
90-100A-#0 Cu or Al

MAIN LUGS:
100A-#0 Cu or Al
225A-300MCM Cu or Al
400A-(2)600MCM Cu or Al

GUTTERS:

AMPS	TOP & BOTTOM	SIDE
100	6″	5″
225	6″	5″
400	8″	5″

MAIN BREAKERS:
60A-#4 Cu or Al
100A-#0 Cu or Al
225A-300MCM Cu or Al
400A-(2) 250MCM or 600MCM Cu or Al

CABINETS:
Galvanized steel with combination knockouts in one end. Fronts and doors finished with ANSI 49 gray baked enamel.

Conforms with Federal Specifications W-P-115a and meets or exceeds W-C-375a, Amendment 4, Classes 2a, 2b and 2c.

TABLE 1
SPECIFY: TYPE

TYPE NQB—BOLT ON BRANCH BREAKERS
10,000 AMPERES I.C. ASYMMETRICAL AND SYMMETRICAL

TABLE 2
SPECIFY:
MAIN—
RATING—
SERVICE—
LIST PRICE—

BASE LIST PRICE

MAIN AMPS	MAIN LUGS ONLY			WITH MAIN BREAKER		
	1Ø, 3W	3Ø, 3W	3Ø, 4W	1Ø, 3W	3Ø, 3W	3Ø, 4W
60A	$110	$ 96	$117	$164	$183	$201
100A	110	96	117	194	213	230
225A	121	117	127	456	528	565
400A	188	176	219	607	692	875

BASE PRICE + BRANCH CIRCUITS + MODIFICATIONS = PRICE OF PANELBOARD

TABLE 3
SPECIFY:
BRANCH BREAKER—
QUANTITY—
RATING—
POLARITY—
LIST PRICE—

LIST PRICE PER BRANCH BREAKER

ITEM	AMPERE RATING	1 POLE 120V	1 POLE 277V	2 POLE		3 POLE 240V
				120/240V	240V	
QB BREAKER	15-60	$10	* $25	$20	$41	$49
	70	...	...	32	43	60
	90-100	...	...	39	53	72
SPACE WITH BUS	15-100	4	...	8	8	11

TABLE 4
MODIFICATIONS

See Pages 18 and 19. SPECIFY MODIFICATIONS AND LIST PRICE.

*15-30A only (Consult factory for 2P and 3P CB's)

QUICK PRICE TABLE FOR TYPE QB BRANCH BREAKERS

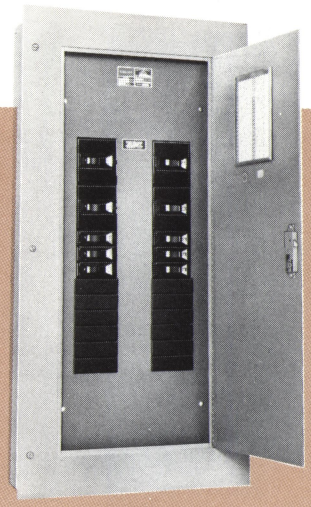
QUAN.	1 POLE	2 POLE						3 POLE			SPACE WITH BRANCH BUS		
	120V	120/240V			240V			240V					
	15-60A	15-60A	70A	100A	15-60A	70A	100A	15-60A	70A	100A	1 POLE	2 POLE	3 POLE
1	$ 10	$ 20	$ 32	$ 39	$ 41	$ 43	$ 53	$ 49	$ 60	$ 72	$ 4	$ 8	$ 11
2	20	40	64	78	82	86	106	98	120	144	8	16	22
3	30	60	96	117	123	129	159	147	180	216	12	24	33
4	40	80	128	156	164	172	212	196	240	288	16	32	44
5	50	100	160	195	205	215	265	245	300	360	20	40	55
6	60	120	192	234	246	258	318	294	360	432	24	48	66
7	70	140	224	273	287	301	371	343	420	504	28	56	77
8	80	160	256	312	328	344	424	392	480	576	32	64	88
9	90	180	288	351	369	387	477	441	540	648	36	72	99
10	100	200	320	390	410	430	530	490	600	720	40	80	110
20	200												
30	300												
40	400												
42	420												

NOTE: For 600 ampere panelboards, refer to Type CDP, Page 14.

For panelboard catalog numbers, box catalog numbers and dimensions, see Page 6.

TYPE NA1B

TO 400 AMPERE MAINS



TYPE NA1B

SERVICE:

1∅, 3W, 120/240V A.C.
1∅, 2W, 240V A.C.
3∅, 4W, 120/208V A.C.
3∅, 3W, 240V A.C.
125/250V D.C.

MAIN LUGS:

100A-#0 Cu or Al
225A-300MCM Cu or Al
400A-(2)600MCM Cu or Al

MAIN BREAKERS:

50A-#4 Cu or Al
100A-#0 Cu or Al
225A- 300MCM Cu or Al
400A-(2)250MCM or
600MCM Cu or Al

BOLT-ON BRANCHES:

TYPE E FRAME
15/50A-#4 Cu or Al
70/100A-#0 Cu or Al

GUTTERS:

AMPS	TOP & BOTTOM	SIDE
100	6″	4″
225	6″	4″
400	8″	4″

CABINETS:

Galvanized steel with combination knockouts in one end. Fronts and doors finished with ANSI 49 gray baked enamel.

Conforms with Federal Specifications W-P-115a and with W-C-375a, Amendment 4, Class 2b and 2C.

TABLE 1
SPECIFY: TYPE

TYPE NA1B—BOLT-ON BRANCH BREAKERS
14,000 AMPERES A.C.—5000 AMPERES D.C.—I.C. SYMMETRICAL

TABLE 2
SPECIFY:
MAIN—
RATING—
SERVICE—
LIST PRICE—

BASE LIST PRICE

MAIN AMPS	MAIN LUGS ONLY			WITH MAIN BREAKER		
	1∅, 3W	3∅, 3W	3∅, 4W	1∅, 3W	3∅, 3W	3∅, 4W
50	$121	$110	$134	$176	$188	$219
100	121	110	134	206	219	243
225	134	121	158	486	541	565
400	194	183	230	766	875	912

BASE PRICE + BRANCH CIRCUITS + MODIFICATIONS = PRICE OF PANELBOARD

TABLE 3
SPECIFY:
BRANCH BREAKERS
QUANTITY—
RATING—
POLARITY—
LIST PRICE—

LIST PRICE PER BRANCH BREAKER

ITEM	AMPERE RATING	1 POLE 240V	2 POLE 240V	3 POLE 240V
BREAKER	15-50 70-100	$23 . . .	$56 83	$ 79 110
SPACE WITH BUS	ALL	7	12	15

TABLE 4
MODIFICATIONS

See Pages 18 and 19.

SPECIFY MODIFICATIONS AND LIST PRICE.

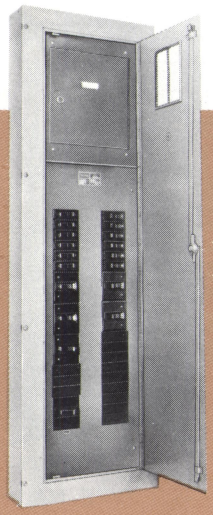
QUICK PRICE TABLE FOR E FRAME BRANCH BREAKERS

QUAN.	1 POLE	2 POLE		3 POLE		SPACE WITH BRANCH BUS		
	15-50A	15-50A	70-100A	15-50A	70-100A	1 POLE	2 POLE	3 POLE
1	$ 23	$ 56	$ 83	$ 79	$ 110	$ 7	$ 12	$ 15
2	46	112	166	158	220	14	24	30
3	69	168	249	237	330	21	36	45
4	92	224	332	316	440	28	48	60
5	115	280	415	395	550	35	60	75
6	138	336	498	474	660	42	72	90
7	161	392	581	553	770	49	84	105
8	184	448	664	632	880	56	96	120
9	207	504	747	711	990	63	108	135
10	230	560	830	790	1100	70	120	150
20	460							
30	690							
40	920							
42	966							

NOTE: For 600 ampere panelboards, refer to Type CDP, Page 14.

For panelboard catalog numbers, box catalog numbers and dimensions, see Page 6.

SCHEDULE PB-1 DISCOUNTS



TYPE NHIB

TYPE NH1B

TO 400 AMPERE MAINS

SERVICE:
3∅, 4W, 277/480V A.C.
3∅, 3W, 480V A.C.
250V D.C.

MAIN LUGS:
100-#0 Cu or Al
225A-300MCM Cu or Al
400A-(2) 600MCM Cu or Al

MAIN BREAKERS:
50A-#4 Cu or Al
100A-#0 Cu or Al
225A-300MCM Cu or Al
400A-(2)250MCM or 600MCM Cu or Al

BOLT-ON BRANCHES:
TYPE EF FRAME
15/50A-#4 Cu or Al
70/100A-#0 Cu or Al

GUTTERS:

AMPS	TOP & BOTTOM	SIDE
100	6″	4″
225	6″	4″
400	8″	4″

CABINETS:
Galvanized steel with combination knockouts in one end. Fronts and doors finished with ANSI 49 gray baked enamel.

Conforms with Federal Specifications W-P-115a and with W-C-375a, Amendment 4, Classes 2a and 2d.

TABLE 1
SPECIFY: TYPE

TYPE NH1B—BOLT ON BRANCH BREAKERS
1, 2 & 3 POLE—15,000 AMP ASYMMETRICAL—14,000 AMP SYMMETRICAL I.C.

TABLE 2
SPECIFY:
MAIN—
RATING—
SERVICE—
LIST PRICE—

BASE LIST PRICE

MAIN AMPS	MAIN LUGS ONLY			WITH MAIN BREAKER		
	1∅, 3W	3∅, 3W	3∅, 4W	1∅, 3W	3∅, 3W	3∅, 4W
50	$121	$110	$134	$219	$230	$256
100	121	110	134	238	285	285
225	134	121	158	486	541	565
400	194	183	230	766	875	912

BASE PRICE + BRANCH CIRCUITS + MODIFICATIONS = PRICE OF PANELBOARD

TABLE 3
SPECIFY:
BRANCH BREAKERS
QUANTITY—
RATING—
POLARITY—
LIST PRICE—

LIST PRICE PER BRANCH BREAKER

ITEM	AMPERE RATING	1 POLE 277V	2 POLE 480V	3 POLE 480V
BREAKER	15-50 70-100	$27 —	$ 99 124	$129 148
SPACE WITH BUS	ALL	7	12	15

TABLE 4
MODIFICATIONS

See Pages 18 and 19.

SPECIFY MODIFICATIONS AND LIST PRICE.

QUICK PRICE TABLE FOR EF FRAME BRANCH BREAKERS

QUAN.	1 POLE	2 POLE		3 POLE		SPACE WITH BRANCH BUS		
	15-50A	15-50A	70-100A	15-50A	70-100A	1 POLE	2 POLE	3 POLE
1	$ 27	$ 99	$ 124	$ 129	$ 148	$ 7	$ 12	$ 15
2	54	198	248	258	296	14	24	30
3	81	297	372	387	444	21	36	45
4	108	396	496	516	592	28	48	60
5	135	495	620	645	740	35	60	75
6	162	594	744	774	888	42	72	90
7	189	693	868	903	1036	49	84	105
8	216	792	992	1032	1184	56	96	120
9	243	891	1116	1161	1332	63	108	135
10	270	990	1240	1290	1480	70	120	150
20	540							
30	810							
40	1080							
42	1134							

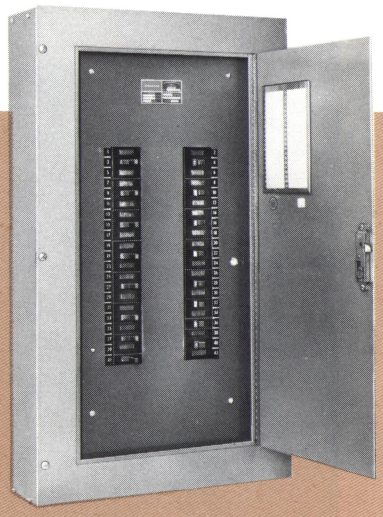
NOTE: For 600 ampere panelboards, refer to Type CDP, Page 14.

For panelboard catalog numbers, box catalog numbers and dimensions, see Page 6.

SCHEDULE PB-1 DISCOUNTS

TYPE NDP • CONVERTIBLE

VOLTAGE TO 480V A.C. — 250V D.C.



TYPE: NDP

15-100 AMP BRANCH BREAKERS:

SYLVANIA TYPE QB & QFB
10,000 Amp I.C.
Fed. Sp. W-C-375A Cl. 2b, 2c & 2d.

E FRAME — 120/240V
14,000 Amp I.C. Sym.
Fed. Sp. W-C-375A Cl. 2b & 2c

EF FRAME —
240V 18,000 Amp I.C. Sym.
480V 14,000 Amp I.C. Sym.
Fed. Sp. W-C-375A Cl. 2d

MAIN BREAKERS:

TYPE QB
50/70A — #4 Cu or Al
90/125A — #0 Cu or Al

TYPE E or EF —
15/50A — #4 Cu or Al
70/100A — #0 Cu or Al

TYPE QFB —
225A — 300MCM Cu or Al

TYPE FJ —
225A — 300MCM Cu or Al

TYPE JL —
400A — 600MCM or
(2) 250MCM Cu or Al

MAIN LUGS:

100A — #0 Cu or Al
225A — 300MCM Cu or Al
400A — (2) 600MCM Cu or Al

GUTTERS:

AMPS	TOP & BOTTOM	SIDE
100	6″	4″
225	6″	4″
400	8″	4″

TABLE 1 SPECIFY: TYPE — **TYPE NDP—BOLT-ON BRANCH BREAKERS**

TABLE 2 SPECIFY: MAIN— RATING— SERVICE— LIST PRICE—

BASE LIST PRICE

MAIN AMPS	MAIN LUGS ONLY				WITH MAIN BREAKERS			
	1∅, 2W	1∅, 3W	3∅, 3W	3∅, 4W	1∅, 2W	1∅, 3W	3∅, 3W	3∅, 4W
50	$ 97	$121	$110	$134	$195	$219	$230	$256
100	97	121	110	134	214	238	285	285
225	103	134	121	158	455	486	541	565
400	151	194	183	230	723	766	875	912
600	REFER TO CDP CONSTRUCTION, PAGE 14							

BASE PRICE + BRANCH CIRCUITS + MODIFICATIONS = PRICE OF PANELBOARD.

TABLE 3 SPECIFY: TYPE OF BRANCH BREAKER RATING— POLARITY QUANTITY— LIST PRICE—

BRANCH CIRCUITS (LIST PRICE PER BREAKER)

BREAKER TYPE	BREAKER AMPS	BREAKER VOLTS	BRANCH CIRCUIT 1 POLE	BRANCH CIRCUIT 2 POLE	BRANCH CIRCUIT 3 POLE	SPACE WITH BUS 1 POLE	SPACE WITH BUS 2 POLE	SPACE WITH BUS 3 POLE
QB	15-60	120	$10	$...	$...	$ 4	$..	$..
		120/240	*(277V) 25	20	...	...	8	...
		240	...	41	49	...	8	11
	70	120/240	...	32	...	...	8	...
		240	...	43	60	...	8	11
	90-100	120/240	...	39	...	...	8	...
		240	...	53	72	...	8	11
E	15-50	240	23	56	79	7	12	15
	70-100	240	...	83	110	...	12	15
EF	15-50	480	*(277V) 27	99	129	7	12	15
	70-100	480	...	124	148	...	12	15

If mixture of QB with E or EF breakers is required in the same panel add $112 per Base.
*15-30A only (Consult factory for 2P and 3P CB's)

TABLE 4 SPECIFY: TYPE— LIST PRICE—

SUBFEED BREAKERS (ONE OR TWO PER PANEL)

QFB	225	240	...	201	251	...	...	...
FJ	225	600	...	322	406	...	...	...

TABLE 5 MODIFICATIONS — See Pages 18 and 19. SPECIFY MODIFICATIONS AND LIST PRICE.

EXAMPLE

120/208V., 3∅, 4 Wire, S/N

225A S/N	
15A-1P	15A-1P
20A-1P	20A-1P
50A-2P	50A-2P
70A-3P	100A-3P
225A 3P	Main Brk.

225A, 3P, w/MCB	$565
2-15A 1P QB @ $10	20
2-20A 1P QB @ $10	20
2-50A 2P QB @ $20	40
1-70A 3P QB	60
1-100A 3P QB	72
	$777

CABINETS

Galvanized steel with combination knock-outs in one end. Fronts and doors gray hammertone baked enamel.

NDP Cabinets are 20″ wide.

Dimensions: Same as lighting panelboards. See Page 6.

Special Features: Refer to Factory.

SCHEDULE PB-1 DISCOUNTS

TYPE QSF

TYPE QSF • FUSIBLE SWITCH

MAIN LUGS TO 1200 AMPS MAIN SWITCH TO 600 AMPS
TO 600 VOLTS A.C.

• CONVERTIBLE •

COMBINE SWITCHES — BREAKERS — MOTOR CONTROL UNITS IN THE SAME PANELBOARD

New QSF Distribution Panelboards bring to the field a new degree of convertibility, never before available.

Type QSF Panels are not limited to the installation of only fusible switches—circuit breakers from Type CDP Panelboard line have similar installation provisions so that they can be combined in the same cabinet.

The convenience of this interchangeability can be extended even more to include the installation of Combination Motor Control Units. These units are complete motor control assemblies (starter and control devices) mounted behind an interlocked door. Motor starter units can be combined with switches or breakers all in one cabinet—a complete distribution and control panel.

Conforms with Federal Specifications W-P-115a

TYPE QSF FUSIBLE SWITCHES

Quick make-quick break mechanism; horsepower rated; rotary handles; AIR-CONDITIONED fuse clips (Sylvania Exclusive) on all 400 and 600 ampere switches. Each unit housed in an individual steel enclosure wth hinged cover. Each cover is interlocked closed when the switch is in the ON position. Interlock can be released by authorized personnel for inspection. Handle can be locked with 3 padlocks and cover can be padlocked for added safety.

CABINETS

Fabricated of code gauge galvanized sheet steel. Panelboard fronts are code gauge sheet steel. Cabinets and Fronts finished with ANSI 49 gray baked enamel over rust-resistant primer. Cabinets can be fitted with doors, if specified. Doors have full length piano hinge and tee handle with 3 point lock.

SERVICE EQUIPMENT

Type QSF Distribution Panelboards are approved for Service Equipment with 6 circuits or less or with a Main Switch.

LAYOUT DATA

240V		SWITCH HEIGHT		600V	
2P	3P			2P	3P
4X	4X	30A	30A	4X	4X
4X	4X	60A	60A	4X	4X
4X	4X	100A	100A		
4X	4X	100A		5X	5X
7X	7X	200A		7X	7X
11X	11X	400A		11X	11X
11X	11X	600A		11X	11X

SWITCH HEIGHTS
ONE X UNIT OF HEIGHT = 1 3/8"

CABINET SELECTION:

Total height required for switches, and for Neutral and Mains Cover Plates indicate panel height needed. Select cabinet with same or next greater Panel Height.

TOTAL PANEL HEIGHT

If panel space needed exceeds 37X, additional cabinets can be used or the panel can be factory assembled in a Floor Standing Section.

When two or more panels must be used, Subfeed Lugs should be specified and priced from page 19.

COMBINATION PANELBOARDS:

When circuit breakers are to be included as branches, refer to page 15 for pricing. When motor control units are to be included in panel, refer to page 16 for pricing.

Switches, Breakers and motor control units are dimensioned to the same "X" height multiple to provide convertibility and interchangeability.

Standardization of design permits simplified field installation of devices for future changes or additions.

BASE LIST PRICE (Use once per panel)

MAIN AMPERES	PHASE			
	1∅, 2W	1∅, 3W	3∅, 3W	3∅, 4W
200	$183	$188	$201	$206
400	230	248	256	274
600	255	267	347	359
800	432	437	444	449
1200	561	578	590	607

ADDITIONAL FEATURES

ITEM	PHASE	CAPACITY OF MAINS				
		225A	400A	600A	800A	1200A
SPLIT BUS	1	$78	$97	$110	$146	$183
SPLIT BUS	3	97	110	121	164	206
SUB LUGS	3∅, 3W	29	58	104	139	183
SUB LUGS	3∅, 4W	39	78	134	164	194

COVER PLATE HEIGHT

AMP RATING MAIN BUS	MAIN LUGS SIZE	"X" UNITS HEIGHT	
		MN LUGS	NEUTRAL①
225	(1) 250MCM	2X	3X
400	(1) 4/0-600MCM	2X	3X
600	(2) 2-600MCM	3X	3X
800	(2) 2-600MCM	3X	3X
1200	(4) 2-600MCM	6X	6X
ALL	MAIN SWITCH	2X	See above

① If required; if not required use 1X for end cover.

CABINET DIMENSIONS

PANEL HEIGHT	WIDE	HIGH	DEEP
37X	35″	70¾″	12″

NOTE: When panel space required exceeds 37X refer to page 31 for Type QSF Floor Standing Sections.

QSF — MAIN OR BRANCH SWITCHES

VOLTS	AMPERE RATING	CATALOG NO.	LIST PRICE		HEIGHT	HORSEPOWER RATING			
			SWITCH	SPACE		N.E.C. STD.	TIME DELAY FUSES		
							240V	480V	600V
240 VOLTS 2 POLE	30/30	QSF-T332B	$ 104	$ 49	4X	1½	3	...	...
	60/60	QSF-T632B	104	49	4X	3	10	...	...
	100/100	QSF-T1032B	158	49	4X	7½	15	...	...
	100	QSF-1032B	85	49	4X	7½	15	...	...
	200	QSF-2032B	188	85	7X	15	...	...	...
	400	QSF-4032	413	134	11X	...	...	...	...
	600	QSF-6032	644	134	11X	...	...	...	...
240 VOLTS 3 POLE	30/30	QSF-T333B	139	49	4X	3	7½	...	...
	60/60	QSF-T633B	139	49	4X	7½	15	...	...
	100/100	QSF-T1033B	194	49	4X	15	30	...	...
	100	QSF-1033B	109	49	4X	15	30	...	...
	200	QSF-2033B	267	85	7X	25	...	...	...
	400	QSF-4033	608	134	11X	50	100	...	...
	600	QSF-6033	850	134	11X	75	100	...	...
480 & 600 VOLTS 2 POLE	30/30	QSF-T352B	152	49	4X	3	...	7½	10
	60/60	QSF-T652B	152	49	4X	5	...	20	25
	100	QSF-1052B	116	60	5X	10	...	...	40
	200	QSF-2052B	256	85	7X	...	...	...	50
	400	QSF-4052	571	134	11X	...	...	...	...
	600	QSF-6052	742	134	11X	...	...	...	...
480 & 600 VOLTS 3 POLE	30/30	QSF-T353B	183	49	4X	5	...	15	20
	60/60	QSF-T653B	183	49	4X	15	...	30	50
	100	QSF-1053B	146	60	5X	25	...	...	50
	200	QSF-2053B	340	85	7X	60	...	100	100
	400	QSF-4053	784	134	11X	100	...	100	100
	600	QSF-6053	935	134	11X	100	...	100	100

PRICING DATA

Make a sketch similar to Example to show layout. List volts, amps and phasing; specify Main Lugs or Main Switch and bus rating; and itemize branch switches. To Base List Price, add prices of Main Switch (when needed), Branches, Motor Control Units, Spaces, and Special Features. Total will show price of Panel. Cabinets can be furnished with doors, when specified. Add $121 list price for each door required.

QSF EXAMPLE

120/208V., 3∅, 4 Wire, S/N

2X	400A MAIN LUGS	
4X	30A-3P	30A-3P
4X	60A-3P	60A-3P
4X	60A-3P	60A-3P
4X	100A-3P	100A-3P
7X	200A-3P	
3X	400A S/N	
28X		

1—400A Base List Price	$ 274
1—30/30A QSF-T333B	139
2—60/60A QSF-T633B @ $139	278
1—100/100A QSF-T1033	194
1-200A QSF-2033	267
TOTAL LIST PRICE	$1152

TYPE CDP

TYPE CDP • CIRCUIT BREAKER

MAIN LUGS TO 1200 AMPS . . .
MAIN BREAKER TO 1200 AMPS
TO 600 VOLTS A.C. — 250 VOLTS D.C.

• CONVERTIBLE •

COMBINE BREAKERS —
SWITCHES —
MOTOR CONTROL UNITS
IN THE SAME PANELBOARD

Sylvania Distribution Panelboards bring to the field a new degree of convertibility, never before available.

Type CDP Panels are not limited to the installation of only circuit breakers—fusible switches from Type QSF Panelboard line have similar installation provisions so that they can be combined in the same cabinet.

The convenience of this interchangeability can be extended even more to include the installation of Combination Motor Control Units. These units are complete motor control assemblies (starter and control devices) mounted behind an interlocked door. Motor starter units can be combined with switches or breakers all in one cabinet—a complete distribution and control panel.

Conforms with Federal Specifications W-P-115a

TYPE CDP CIRCUIT BREAKERS

Quick make — quick break, common trip molded case frames thru 1200 amperes. Breakers can be removed from the front of the panelboard without disturbing adjacent units. Mounting plates and bus bar connectors are standardized so that breakers can be removed, changed or readily converted within their frame size. Formed plates cover the surface of all breakers to provide padlock provisions for each circuit.

CABINETS

Fabricated of code gauge galvanized sheet steel. Panelboard fronts are code gauge sheet steel. Cabinets and Fronts finished with ANSI 49 gray baked enamel over rust-resistant primer. Cabinets can be fitted with doors, if specified. Doors have full length piano hinge and tee handle with 3 point lock.

SERVICE EQUIPMENT

Type CDP Distribution Panelboards approved for Service Equipment with 6 circuits or less or with a Main Breaker.

LAYOUT DATA

1 POLE	QB, FRAME	1 POLE	①
2 POLE		2 POLE	2X
3 POLE		3 POLE	2X
1 POLE	E, EF, HEF FRAME	1 POLE	②
2 POLE		2 POLE	3X
3 POLE		3 POLE	3X
2 POLE	QFB FRAME	2 POLE	3X
3 POLE		3 POLE	4X
2 POLE	FJ, FK, HFJ FRAME	2 POLE	3X
3 POLE		3 POLE	3X
2 POLE	JL, JK FRAME	2 POLE	6X
3 POLE		3 POLE	6X
2 POLE	400 AMP QL FRAME	2 POLE	4X
3 POLE		3 POLE	6X
2 OR 3 POLE HFJ FRAME			3X
600 AMP 2 POLE QL FRAME			4X
600 AMP 3 POLE QL FRAME			6X
2 OR 3 POLE M, HM, N, HN FRAME			6X

QB & HQB 1 POLE BREAKERS ①	HEIGHT
2 to 4 Poles	2X
5 to 8 Poles	3X
9 to 12 Poles	4X

E, EF & HEF 1 POLE BREAKERS ②	HEIGHT
2 to 4 Poles	4X
5 to 8 Poles	5X
9 to 12 Poles	7X
13 to 16 Poles	9X

Add $121 list price for each door required.

COMBINATION PANELBOARDS:
When fusible switches are to be included as branches, refer to page 13 for pricing. When motor control units are to be included in panel, refer to page 16 for pricing.

Switches, breakers and motor control units are dimensioned to the same "X" height multiple to permit interchangeability and convertibility.

BREAKER SPACE HEIGHTS:
E, EF, FJ, FK, JL, JK and 400 amp frame QL breakers are mounted by pairs — 1 height space will hold 2 devices. 600 amp frame QL and all M, KM, HM and HKM breakers each require 1 full height space.

TOTAL PANEL HEIGHT:
If space needed exceeds 37X, additional cabinets can be used or the panel factory assembled in a Floor Standing Section.

CABINET SELECTION:
Total height required for devices plus Neutral and Mains Cover Plates indicate panel height needed. Select cabinet with same or next greater Panel Height. When 2 or more panels are used, Subfeed Lugs should be ordered and priced from page 19.

BREAKER HEIGHTS
ONE X UNIT OF HEIGHT = 1⅜"

BASE LIST PRICE (Use once per panel)

MAIN AMPERES	PHASE			
	1∅, 2W	1∅, 3W	3∅, 3W	3∅, 4W
200	$183	$188	$201	$206
400	230	248	256	274
600	255	267	347	359
800	432	437	444	449
1200	561	578	590	607

COVER PLATE HEIGHT

AMP RATING MAIN BUS	MAIN LUGS SIZE	"X" UNITS HEIGHT	
		MN LUGS	NEUTRAL①
225	(1) 250MCM	2X	3X
400	(1) 4/0-600MCM	2X	3X
600	(2) 2-600MCM	3X	3X
800	(2) 2-600MCM	3X	3X
1200	(4) 2-600MCM	6X	6X
ALL	MAIN BREAKER	2X	See above

① If required; if not required use 1X for end cover.

MAIN OR BRANCH BREAKERS

TYPE	AMPERE RATING	POLES	LIST PRICE			HEIGHT
			BREAKER	SPACE	FUTURE PROV	
QB	15-50 • 120/240V	1	$25	$ 7	$ 13	①
	②15-30 • 277V	1	37	7	13	
	60 • 120/240V	2	50	13	22	2X
	60 • 240V	2	58	13	22	2X
	70 • 240V	2	73	13	22	2X
	100 • 240V	2	80	13	22	2X
	15-50 • 240V	3	80	13	22	2X
	70 • 240V	3	90	13	22	2X
	100 • 240V	3	102	13	22	2X
E	15-50 240V	1	35	7	13	①
		2	64	19	26	3X
		3	95	19	30	3X
	70-100 240V	2	94	19	26	3X
		3	122	19	30	3X
EF②	15-50 • 277V	1	39	7	13	①
EF	15-50 480V	2	104	19	26	3X
		3	134	19	30	3X
	70-100 480V	2	134	19	26	3X
		3	158	19	30	3X
	15-50 600V	2	119	19	26	3X
		3	158	19	30	3X
	70-100 600V	2	146	19	26	3X
		3	183	19	30	3X
QFB	125-225 240V	2	194	19	36	3X
		3	248	26	50	4X
QL	250-400 240V	2	486	26	56	4X⑤
		3	608	39	78	6X⑤
	500-600 240V	2	789	52	98	4X⑤
		3	1032	78	134	6X⑤
FJ	70-225 600V	2	316	19	36	3X
		3	395	19	50	3X
FK③	125-225 600V	2	395	19	36	3X
		3	462	19	50	3X
JL	125-400 600V	2	565	39	56	6X
		3	680	39	78	6X
JK③	125-400 600V	2	620	39	56	6X
		3	766	39	78	6X
M③	500-600 600V	2	948	78	98	6X
		3	1190	78	134	6X
	700-800 600V	2	1239	78	127	6X
		3	1567	78	170	6X
N ③	1000 600V	2	1652	78	188	6X
		3	1981	78	256	6X
	1200 600V	2	2406	78	188	6X
		3	2733	78	256	6X

For Circuit Breaker Characteristics See Page 43

ADDITIONAL FEATURES

ITEM	PHASE	CAPACITY OF MAINS				
		225A	400A	600A	800A	1200A
SPLIT BUS	1	$78	$97	$110	$146	$183
SPLIT BUS	3	97	110	121	164	206
SUB LUGS	3∅, 3W	29	58	104	139	183
SUB LUGS	3∅, 4W	39	78	134	164	194

CABINET DIMENSIONS

PANEL HEIGHT	WIDE	HIGH	DEEP
28X	35″	58½″	12″
37X	35″	70¾″	12″

NOTE: When panel space required exceeds 37X refer to page 33 for Type CBC Floor Standing Sections.

MAIN OR BRANCH HIGH I.C. BREAKERS

TYPE	AMPERE RATING	POLES	LIST PRICE			HEIGHT
			BREAKER	SPACE	FUTURE PROV	
HEF	②15-50 • 277V	1	$ 78	$ 7	$ 13	①
	15-50 • 600V	2	183	19	26	3X
		3	213	19	30	3X
	70-100 600V	2	201	19	26	3X
		3	238	19	30	3X
HFJ	70-225 600V	2	692	19	36	3X
		3	838	19	50	3X
HJL	125-400 600V	2	935	39	56	6X
		3	1142	39	78	6X
HM ③	500-600 600V	2	1191	78	98	6X
		3	1456	78	134	6X
	800 600V	2	1518	78	127	6X
		3	1871	78	170	6X
HN ③	1000 600V	2	1907	78	188	6X
		3	2224	78	256	6X
	1200 600V	2	2613	78	188	6X
		3	2856	78	256	6X

CDP EXAMPLE

120/208V., 3∅, 4 Wire, S/N

3X	600A S/N		600A Base List Price	$ 359
4X	40A-1P	40A-1P	2----40A-1P E @ 35	70
3X	100A-3P	Space	1----100A-3P E	122
3X	225A-3P	225A-3P	1----Space (100/3)	19
6X	600A-3P Main Bkr.		2----225A-3P FJ @ 395	790
2X	Cover Plate		1----600A-3P M	1190
			TOTAL LIST PRICE	$2550

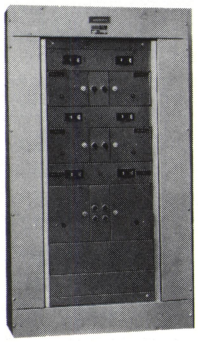
21X Requires Cabinet with 28X Panel Height
1 Cabinet 35″ Wide x 58½″ High x 12″ Deep

②For 277/480 Volts, 3∅, 4W, SN.
③With Interchangeable Trip.
④See page 14 for Space Heights.
⑤8X spaces required when used as main.

SCHEDULE PB-2 DISCOUNTS

MOTOR CONTROL PANELBOARDS
MOTOR STARTERS WITH FUSIBLE SWITCHES OR BREAKERS

FACTORY ASSEMBLED



TYPE CMC

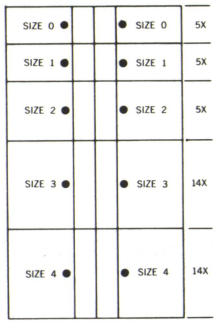
TYPE CMC-QSF

TO 600 VOLTS A.C.
MAIN LUGS TO 1200 AMPS OR
MAIN SWITCH TO 600 AMPS
SWITCH & FUSE TYPE

TYPE CMC-CDP

TO 600 VOLTS A.C. — 250 V. D.C.
MAIN LUGS TO 1200 AMPS OR
MAIN BREAKER TO 1200 AMPS
CIRCUIT BREAKER TYPE

Motor starter and fusible switch combinations, motor starter and circuit breaker combinations, fusible switch branches and breaker branches can be combined or interchanged. Relays, time switches, transformers and other control devices can also be included. A mechanical interlock prevents opening of cell door unless disconnect is in OFF position. Each starter factory wired to its disconnect device and provided with an external reset button in its door. Cell installed directly below its disconnect.



CELL HEIGHTS

REFER TO PAGE 19 FOR ACCESSORIES

BASE LIST PRICE (Use once per panel)

MAIN AMPERES	PHASE			
	1∅, 2W	1∅, 3W	3∅, 3W	3∅, 4W
200	$183	$188	$201	$206
400	230	248	256	274
600	255	267	347	359
800	432	437	444	449
1200	561	578	590	607

COVER PLATE HEIGHT

AMP RATING MAIN BUS	MAIN LUGS SIZE	"X" UNITS HEIGHT	
		MN LUGS	NEUTRAL[1]
225	(1) 250MCM	2X	3X
400	(1) #4/0-600MCM	2X	3X
600	(2) #2-600MCM	3X	3X
800	(2) #2-600MCM	3X	3X
1200	(4) #2-600MCM	6X	6X
ALL	MAIN DISCONNECT	2X	See above

ADDITIONAL FEATURES

ITEM	PHASE	CAPACITY OF MAINS				
		225A	400A	600A	800A	1200A
SPLIT BUS	1	$78	$97	$110	$146	$183
SPLIT BUS	3	97	110	121	164	206
SUB LUGS	3∅, 3W	29	58	104	139	183
SUB LUGS	3∅, 4W	39	78	134	164	194

CABINET DIMENSIONS

PANEL HEIGHT	WIDE	HIGH	DEEP
28X	35″	58½″	12″
37X	35″	70¾″	12″

NOTE: When panel space required exceeds 37X refer to page 36 for Floor Standing Sections.

STARTER UNITS (DISCONNECT NOT INCLUDED IN LIST PRICE)

NEMA STARTER SIZE		STARTER HORSEPOWER								LIST PRICE STARTERS 3RD O.L. INCLUDED		HEIGHT X UNITS	MAX. FUSES AMP RATING (TIME DELAY)		MAX. CIRCUIT BREAKER AMP RATING			
		200V		230V		460V									208-230V		460V	
LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT			WIRED	FUTURE PROV.		LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT
3 POLE ACROSS THE LINE STARTER UNITS																		
0	.	3	..	3	..	5	..			$ 256	$ 97	5X	30	....	20	....	20	....
0	0	3	3	3	3	5	5			395	97	5X	30	30	20	20	20	20
1	.	7½	..	7½	..	10	..			274	97	5X	30	....	50	....	30	....
1	0	7½	3	7½	3	10	5			426	97	5X	30	30	50	20	30	20
1	1			7½	7½	10	10			456	97	5X	30	30	50	50	30	30
2	.	10	..	15	..	25	..			389	122	5X	60	....	100	....	70	....
2	0	10	3	15	3	25	5			493	122	5X	60	30	100	20	70	20
2	1	10	7½	15	7½	25	10			546	122	5X	60	30	100	50	70	30
2	2	10	10	15	15	25	25			632	122	5X	60	60	100	100	70	70
3	.	25	..	30	..	50	..			742	201	14X	100	....	125	....	125	....
3	2	25	10	30	15	50	25			1099	201	14X	100	60	125	100	125	70
3	3	25	25	30	30	50	50			1112	201	14X	100	100	125	125	125	125
4	.	40	..	50	..	100	..			1239	201	14X	200	....	225	....	225	....
4	2	40	10	50	15	100	25			1531	201	14X	200	60	225	70	225	70
4	3	40	25	50	30	100	50			1701	201	14X	200	100	225	125	225	125
4	4	40	40	50	50	100	100			2127	201	14X	200	200	225	225	225	225
3 POLE REVERSING STARTER UNITS — SINGLE UNITS																		
0		3		3		5				478	122	8X	30		20		20	
1		7½		7½		10				504	122	8X	30		50		30	
2		10		15		25				753	122	8X	60		100		70	
3		25		30		50				1166	201	14X	100		125		125	
3 POLE PART WINDING STARTER UNITS — SINGLE UNITS																		
2PW		20		25		40				1093	122	8X	200		125		125	
3PW		40		50		75				1688	201	14X	200		225		225	
4PW		75		75		150				3189	201	14X	400		400		400	

[1] If required; if not required use 1X for end cover.

SCHEDULE PB-1 DISCOUNTS

QSF — MAIN OR BRANCH SWITCHES

VOLTS	AMPERE RATING	CATALOG NO.	LIST PRICE SWITCH	LIST PRICE SPACE	HEIGHT	HORSEPOWER RATING N.E.C. STD.	HORSEPOWER RATING TIME DELAY FUSES 240V	480V	600V
240 VOLTS 2 POLE	30/30	QSF-T332B	$ 104	$ 49	4X	1½	3	...	...
	60/60	QSF-T632B	104	49	4X	3	10	...	...
	100/100	QSF-T1032B	158	49	4X	7½	15	...	...
	100	QSF-1032B	85	49	4X	7½	15	...	...
	200	QSF-2032B	188	85	7X	15	...	...	...
	400	QSF-4032	413	134	11X	...	...	...	...
	600	QSF-6032	644	134	11X	...	...	...	...
240 VOLTS 3 POLE	30/30	QSF-T333B	139	49	4X	3	7½	...	...
	60/60	QSF-T633B	139	49	4X	7½	15	...	...
	100/100	QSF-T1033B	194	49	4X	15	30	...	...
	100	QSF-1033B	109	49	4X	15	30	...	...
	200	QSF-2033B	267	85	7X	25	...	...	...
	400	QSF-4033	608	134	11X	50	100	...	...
	600	QSF-6033	850	134	11X	75	100	...	...
480 & 600 VOLTS 2 POLE	30/30	QSF-T352B	152	49	4X	3	...	7½	10
	60/60	QSF-T652B	152	49	4X	5	...	20	25
	100	QSF-1052B	116	60	5X	10	...	...	40
	200	QSF-2052B	256	85	7X	...	...	...	50
	400	QSF-4052	571	134	11X	...	...	...	...
	600	QSF-6052	742	134	11X	...	...	...	...
480 & 600 VOLTS 3 POLE	30/30	QSF-T353B	183	49	4X	5	...	15	20
	60/60	QSF-T653B	183	49	4X	15	...	30	50
	100	QSF-1053B	146	60	5X	25	...	50	50
	200	QSF-2053B	340	85	7X	60	...	100	100
	400	QSF-4053	784	134	11X	100	...	250	350
	600	QSF-6053	935	134	11X	100	...	400	500

MAIN OR BRANCH BREAKERS

TYPE	AMPERE RATING	POLES	LIST PRICE BREAKER	LIST PRICE SPACE	LIST PRICE FUTURE PROV	HEIGHT
QB	15-50 • 120/240V	1	$25	$ 7	$ 13	①
	15-30 • 277V②	1	37	7	13	
	60 • 120/240V	2	50	13	22	2X
	60 • 240V	2	58	13	22	2X
	70 • 240V	2	73	13	22	2X
	100 • 240V	2	80	13	22	2X
	15-50 • 240V	3	80	13	22	2X
	70 • 240V	3	90	13	22	2X
	100 • 240V	3	102	13	22	2X
E	15-50 240V	1	35	7	13	①
		2	64	19	26	3X
		3	95	19	30	3X
	70-100 240V	2	94	19	26	3X
		3	122	19	30	3X
EF②	15-50 • 277V	1	39	7	13	①
EF	15-50 480V	2	104	19	26	3X
		3	134	19	30	3X
	70-100 480V	2	134	19	26	3X
		3	158	19	30	3X
	15-50 600V	2	119	19	26	3X
		3	158	19	30	3X
	70-100 600V	2	146	19	26	3X
		3	183	19	30	3X
QFB	125-225 240V	2	194	19	36	3X
		3	248	26	50	4X
QL	250-400 240V	2	486	26	56	4X⑤
		3	608	39	78	6X⑤
	500-600 240V	2	789	52	98	4X⑤
		3	1032	78	134	6X⑤
FJ	70-225 600V	2	316	19	36	3X
		3	395	19	50	3X
FK③	125-225 600V	2	395	19	36	3X
		3	462	19	50	3X
JL	125-400 600V	2	565	39	56	6X
		3	680	39	78	6X

MAIN OR BRANCH BREAKERS

TYPE	AMPERE RATING	POLES	LIST PRICE BREAKER	LIST PRICE SPACE	LIST PRICE FUTURE PROV	HEIGHT
JK③	125-400 600V	2	620	39	56	6X
		3	766	39	78	6X
M③	500-600 600V	2	948	78	98	6X
		3	1190	78	134	6X
	700-800 600V	2	1239	78	127	6X
		3	1567	78	170	6X
N ③	1000 600V	2	1652	78	188	6X
		3	1981	78	256	6X
	1200 600V	2	2406	78	188	6X
		3	2733	78	256	6X

MAIN OR BRANCH HIGH I.C. BREAKERS

TYPE	AMPERE RATING	POLES	LIST PRICE BREAKER	LIST PRICE SPACE	LIST PRICE FUTURE PROV	HEIGHT
HEF	15-50 • 277V②	1	$ 78	$ 7	$ 13	①
	15-50 • 600V	2	183	19	26	3X
		3	213	19	30	3X
	70-100 600V	2	201	19	26	3X
		3	238	19	30	3X
HFJ	70-225 600V	2	692	19	36	3X
		3	838	19	50	3X
HJL	125-400 600V	2	935	39	56	6X
		3	1142	39	78	6X
HM ③	500-600 600V	2	1191	78	98	6X
		3	1456	78	134	6X
	800 600V	2	1518	78	127	6X
		3	1871	78	170	6X
HN ③	1000 600V	2	1907	78	188	6X
		3	2224	78	256	6X
	1200 600V	2	2613	78	188	6X
		3	2856	78	256	6X

②For 277/480 Volts, 3Ø, 4W, SN. ③With Interchangeable Trip. ④See page 14 for Space Heights. ⑤8X spaces required when used as main.

For Circuit Breaker Characteristics See Page 43

NOTE: See page 14 for Layout Data. SCHEDULE PB-1 DISCOUNTS

LIGHTING & DISTRIBUTION PANELBOARDS
SPECIAL FEATURES

ENCLOSURE MODIFICATIONS

DEPTH INCREASE:
20″ wide cabinet to 8″ maximum depth . . . . . $ *78
35″ wide cabinet to 18″ maximum depth *104

SIDE GUTTER INCREASE:
For each 7″ or fraction thereof in width *64

END GUTTER INCREASE:
For each 12″ or fraction thereof in length *64

WEATHERPROOF OR RAINTITE CABINET:
20″ wide cabinet:
Single door type *170
Door back to door type *213
35″ wide cabinet:
Single door type *213
Door back to door type *328

DRIP PROOF HOOD FOR CABINET:
Drip shield welded at top of cabinet *39
One drip shield welded at top of cabinet and one welded to trim over panelboard door *64

GAUGE INCREASE (heavier than Code gauge):
Cabinet or front *45
Cabinet and front *64

SPECIAL KNOCKOUTS OR DRILLINGS:
Drilling template must accompany order *26

SPECIAL PAINT COLORS: for FRONTS — other than ANSI 49, ANSI 61, light gray or primer coat. Same charge for painting boxes (std. box is unpainted galvanized steel).
First box or Front 109
Each additional box or Front 29

UNI-FLAT FRONT 92

STAINLESS STEEL:
CABINETS OR FRONTS . . . . . Refer to Factory

ALUMINUM:
CABINETS OR FRONTS . . . . . Refer to Factory

GALVANIZED SHEET STEEL FRONT *60

SPECIAL FRONT OR DOOR ARRANGEMENT:
Door-in-door inner door over interior and outer door over wiring gutters *97
Double or split door, one above the other *97

DUST RESISTANT FRONT: (NEMA 1a):
20″ wide cabinet *92
35″ wide cabinet *122

FRONT HINGED TO CABINET *49

PERMANENT CIRCUIT NUMBERS (Per Panel) 68

LOCKS: Other than standard 50
Standard Locks: NATIONAL 68-226
T-Handle: YALE 1403
Uniflat Fronts furnished with standard locks only:
Keys for standard locks are LL803.

ANSI 49 TOUCH-UP PAINT (Aerosol can) 14

NAMEPLATES:
Engraved phenolic 3″ wide x 1″ high 11

ADDITIONAL FEATURES

ACCESSORIES FOR LIGHTING PANELBOARDS:

AUXILIARY COMPARTMENT:
Space only for Time Switch, Relay, etc. $140

PILOT LIGHT OR PUSH BUTTON IN FRONT:
Device including installation: 72

TUMBLER OR TOGGLE SWITCHES:
Device including installation:
1 pole 58
2 pole 64
3 pole 72

CIRCUIT BREAKER ACCESSORIES:
HANDLE LOCK-OFF: Type QB, QFB 2
Type E, EF, FJ, FK, JK, JL, M, N 5

FILLER PLATE: Type NQP, NA1B and NH1B 2

HANDLE PADLOCKING DEVICE:
Type QB, E, EF 2
Type QFB, FJ, FK 8
Type JK, JL, M, N 13

INTERIOR AND TRIM FOR EXISTING BOX:
Same depth or deeper than standard box and no mounting brackets required . . . . . Regular List Price

Deeper than standard box and when mounting brackets are required. Add to standard panelboard price 63

Shallower than standard box. Add to standard panelboard price 86

Special trim only for existing box. Add to standard panelboard price 86

GROUND BUS:
Multi-terminal 57

GROUND LUG 24

COPPER BUS (TIN PLATED):
20″ wide cabinets 78
35″ wide cabinets . . . . . Refer to Factory

COPPER BUS (SILVER PLATED):
20″ wide cabinets 117
35″ wide cabinets . . . . . Refer to factory

LIGHTING PANEL CABINETS:
Lighting panels with control devices are installed in single door cabinets. The device compartment is covered by a separate inner door.
Branch breaker combination panels: When TWO types of branch breakers are combined in a panel add 6″ in height for transition bussing. 122

LIGHTING PANELS MOUNTED ON RISER BUS DUCT:
Refer to Factory for dimensions and prices.

*On items marked with (*) deduct 25% when one order calls for duplicate cabinets with same special features or when 10 or more assorted panels are ordered with the same special feature.

SCHEDULE PB-1 DISCOUNTS

CONTACTORS BUILT-IN (Sylvania Standard) 600 VOLT

MECHANICALLY HELD

AMPS	2 POLE	3 POLE
30	$ 528	$ 578
60	608	669
75	608	669
100	716	753
150	1264	1531
200	1495	1714

ELECTRICALLY HELD

GENERAL USE	LAMP LOAD①	2 POLE	3 POLE
10 Amp	5 Amp	$ 199	$ 210
20 Amp	15 Amp	230	248
30 Amp	30 Amp	248	261
60 Amp	60 Amp	377	401
100 Amp②	100 Amp②	546	583
200 Amp②	200 Amp②	1228	1434

① For Fluorescent Lamps use General Use ratings.
② Requires 8" Deep Box.

AUXILIARY RELAY:
For 2-wire control of mechanically held contactor —
30-100A: $108
150-250A: 324

VIBRATION MOUNTS: Sound absorbers $189

TIME SWITCHES:
(Includes space, device & mounting—no wiring)

TYPE	1 POLE	2 POLE	3 POLE
24 Hour			
Single Throw	$194	$206	$274
Double Throw	206	285	. . .
Astronomic Dial			
Single Throw	230	243	303
Double Throw	248	352	. . .
7 Day Calendar			
Single Throw	230	248	274
Double Throw	248	267	. . .

RESERVE POWER: Add $252

ADDITIONAL FEATURES

PANELBOARD SKIRTS:
U-shaped sheet metal skirts from panel to ceiling OR panel to floor. Each Skirt:
20" wide cabinet *$97
35" wide cabinet *170

MOTOR CONTROL ACCESSORIES

PUSH BUTTONS:
"ON-OFF" or "START-STOP" . . . . . $ 46
"FORWARD-REVERSE-OFF" 85

SELECTOR SWITCHES:
"ON-OFF" or "HAND-OFF-AUTOMATIC" 35

PILOT LIGHT (specify color) 60
EXTRA INTERLOCK ON STARTER 24

CONTROL POWER TRANSFORMER:
(Single sec. fuse included)
For size 00, 0 & 1 starter 102
For size 2 starter 113
For size 3 starter 146
For size 4 starter 176

SPLIT BUS OR METER LOOP

20" WIDE CABINET

NO. POLES	MAINS AMPERE RATING	
	100A-225A	400A
2	$42	$ 89
3	62	105

35" WIDE CABINET

NO. POLES	MAINS AMPERE RATING				
	225A	400A	600A	800A	1200A
2	$78	$ 97	$110	$146	$183
3	97	110	121	164	206

SUB-FEED BREAKERS (MAX. 2 PER PANEL)

NO. POLES	AMPERE RATING OF SUB-FEED					
	E FRAME		EF FRAME		QFB	FJ FRAME
	15-50A	70-100A	15-50A	70-100A	125-225A	125-225A
2	$56	$ 83	$ 99	$124	$201	$322
3	79	110	129	148	251	406

LIGHTING PANELS	SUB-FEED LUGS		THRU FEED LUGS	
MAIN AMPS	3 WIRE	4 WIRE	3 WIRE	4 WIRE
100A	$19	$24	$ 85	$ 92
225A	27	37	97	104
400A	54	65	112	120

SUB-FEED LUGS—Distribution Panel

	AMPERE RATING				
	225A	400A	600A	800A	1200A
3 WIRE	$29	$58	$104	$139	$183
4 WIRE	39	78	134	164	194

NON-AUTOMATIC CIRCUIT BREAKERS

FRAME SIZE	MAX. AMPS.	DEDUCT FROM STANDARD C/B'S	
		2 POLE	3 POLE
E, EF	100	NONE	NONE
FJ	225	$ 24	$ 31
JL	400	67	85
M	600	194	225
M	800	419	517

RELAYS—MECHANICALLY HELD—25 AMP

POLES	LIST PRICE	POLES	LIST PRICE
1	$481	6	$ 934
2	632	8	1229
3	694	10	1366
4	774	12	1489

*Refer to Page 18.

SYLVANIA SYSTEM GFS

GROUND FAULT DETECTION FOR SERVICE ENTRANCE EQUIPMENT

SIMPLIFIED INSTALLATION:

GFS is an in-line sensor that requires only two bolted connections to become an integral part of the ground strap circuit. The small sensor eliminates the need for bulky current transformers and a coil to encircle the incoming power bus. It is an ideal device for rehabilitating existing switchboards to conform to latest safety standards (OSHA, etc.).

Other sensors, using zero-sequence toroidal transformers require costly "tortured bus" configurations that are difficult to install without enlarged enclosures.

OPTIMUM SENSITIVITY:

Field adjustable sensitivity (ranging from 150 to 1200 amperes) is provided within the sensor — allowing it to sense the ground fault current flow and then directly initiate a contact closing through the system relay.

RELIABILITY:

Designed to comply with the 1975 NEC 230-95, Sylvania's system GFS will operate in all low voltage, grounded service entrance equipment. The sensor's patented magnetic induction device is guaranteed for 100,000 operations to provide consistent detection of fault currents.

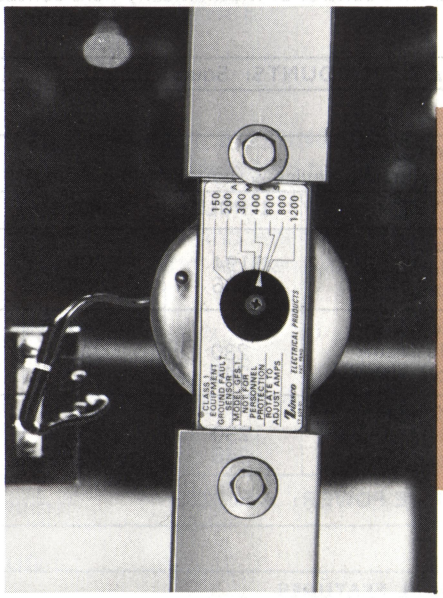
OPERATION:

System GFS has two principal components, the current sensor and a solid-state relay with a built-in testing station. When the sensor detects a ground current, the relay directly actuates the shunt trips on air circuit breakers, molded case breakers or heavy duty switches to open the offending circuit. Auxiliary relays are not required. System GFS is rated 6 amps continuous, 22 amp for 20 cycles, and will not burn out should the main disconnect shunt trip fail to function on first impulse.

FEATURES:

- Field adjustable time delay .1 second to .9 second.
- Full range flexibility.
- In-operation pilot light.
- Tripped-by-ground indicator indicates the main disconnect has been automatically tripped by a ground fault condition.
- Dual test station for testing of the entire ground fault system.

Relay with Built-in Testing Station GFS-2.



Sensor in Neutral Bus

OSHA

SYSTEM GFS provides the easiest system for complying with OSHA. It is now mandatory to install ground fault protection in all new or to-be-modified service entrance equipment in accordance with **NEC 230-95.**

CATALOG No.	ITEM	DESCRIPTION	PRICE
GFS	Sensor	150-1200 ampere adjustable range sensing device; connected in grounded neutral circuit of 600 volt class service entrance equipment.	Refer to Factory
GFS-2	Relay	Flush surface mounted solid-state, relay and test center for 120 volt. 60 Hertz connection to loadside of main disconnect with: • adjustable time delay .1 seconds to .9 seconds • dual testing station for trip or no-trip of main disconnect • tripped-by-ground indicator • in-operation pilot light	Refer to Factory
GFS-3	Relay	Flush/surface mounted, solid-state relay center, for 120 volt. 60 Hertz connection to load side of main disconnect with: • adjustable time delay .1 seconds to .9 seconds • in-operation pilot light	Refer to Factory

DISTRIBUTION SWITCHBOARDS

TO 600 VOLTS A.C.
DEADFRONT

DEFINITION

A Sylvania Uni-form'd, dead front, Distribution Switchboard has no exposed live parts on the front and consists of one or more vertical sections in which are mounted: switching, measuring, circuit control and/or protective devices. Reference NEMA Std. PB2-1.01.

CONSTRUCTION DETAILS

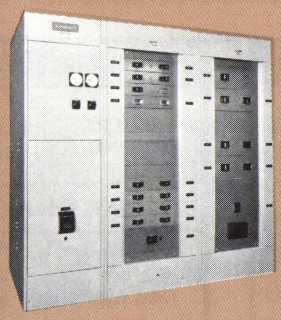
- A structure 90 inches high with a completely welded cubicle constructed from double formed side supports to provide the greatest possible rigidity and strength.
- Vertical sections interconnected with constant positioned horizontal bus bars.
- Totally enclosed, except bottom, for maximum safety.
- Space at top or bottom for line or load conduit or cable.
- Standardized components and supports for easy field installation, when required.

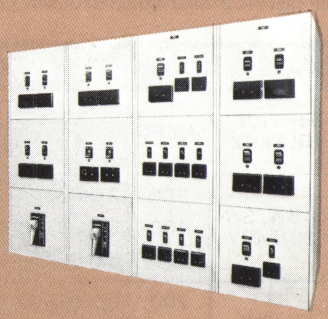
COMPONENTS

FUSIBLE SWITCHES
30 - 5000 amperes

MOLDED CASE
CIRCUIT BREAKERS
15 - 4000 amperes

AIR
CIRCUIT BREAKERS
225 - 4000 amperes





DESIGN DATA	FORMERLY NEMA CLASS I	FORMERLY NEMA CLASS II	FORMERLY NEMA CLASS III
Main Bus Rating	2000 Amps Maximum	4000 Amps Maximum	4000 Amps Maximum
Branch C/B's, Switches	Group Mounted	Group Mounted	Individually Mounted
Structure Mounting	**Against Wall, Self Supporting**	Self Supporting	Self Supporting
Accessibility	Front Only	Line & Load Front Only Main Bus, Rear Only	Line, Load and Bus Rear Only
Depth	14" & 24"	24", 36", 40" & 48"	24", 36", 48", 54", 60", & 66"

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

NOTES

- Main Incoming Section determines depth.
- Distribution Section depth can be reduced.
- 400-1200 Amp Mains 14" deep.
- 1600- 2000 Amp Mains 24" deep.
- Main and Distribution Section widths are determined by devices. For specific information, refer to individual Switchboard types listed in this Digest.

LISTED BY UNDERWRITERS' LABORATORIES, INC.

SERVICE & DISTRIBUTION COMBINATION
WITH QSF FUSIBLE SWITCHES

TYPE SC-QSF

TO 600 AMPERES TO 600 VOLTS A.C.

WITH QSF FUSIBLE SWITCHES

UTILITY METERING SPECIFICATIONS

STYLE P STYLE W

METER PROVISIONS: Each section provided with socket type or "A" Base mounting provisions, as specified.

C.T. COMPARTMENT: Fully bussed to conform with Power Company specifications. Other configurations available, as required.

UNDERGROUND SERVICE: An underground Pull Section can be joined to either left or right side of section. Refer to table below for selection data.

SECTION DIMENSIONS: 35″ wide x 90″ high x 14″ deep.

DISTRIBUTION PANEL SPACE: Space is based on X = 1⅜″ multiples, and 22X spaces are available for main and/or sub-feed switches. Total height for main and sub-feed switches must not exceed this space. Should switch space required be greater than the 22X space available, select a Service Section and a Distribution Panel or Section.

Twin type switches are mounted side-by-side. Height shown is for 2 adjoining devices.

TO ORDER — SPECIFY: Power Co.; Catalog No. of Basic Section; ampere rating of main switch; quantity and ratings of sub-feed switches; overhead or underground service.

PRICING: Price Basic Section; add price of sub-feed devices; add price of Underground Pull Section if required.

NOTE: Main switch may be omitted where local requirements permit six subdivisons of load.

ONE X UNIT OF HEIGHT = 1⅜″

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

BASIC SECTION WITH MAIN FUSIBLE SWITCH*

SERVICE VOLTAGE	AMPS	STYLE P		STYLE W	
		CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE
1ø, 3W, S/N 120/240V	200	SC-QSF20-3SN-P	$1274	SC-QSF20-3SN-W	$1274
	400	SC-QSF40-3SN-P	1500	SC-QSF40-3SN-W	1500
	600	SC-QSF60-3SN-P	1785	SC-QSF60-3SN-W	1785
3ø, 3W 240V	200	SC-QSF20-33-P	1494	SC-QSF20-33-W	1494
	400	SC-QSF40-33-P	1835	SC-QSF40-33-W	1835
	600	SC-QSF60-33-P	2147	SC-QSF60-33-W	2147
3ø, 3W 480V	200	SC-QSF20-63-P	1567	SC-QSF20-63-W	1567
	400	SC-QSF40-63-P	2011	SC-QSF40-63-W	2011
	600	SC-QSF60-63-P	2232	SC-QSF60-63-W	2232
3ø, 4W, S/N 120/208V	200	SC-QSF20-34SN-P	1554	SC-QSF20-34SN-W	1554
	400	SC-QSF40-34SN-P	1895	SC-QSF40-34SN-W	1895
	600	SC-QSF60-34SN-P	2207	SC-QSF60-34SN-W	2207
3ø, 4W, S/N 277/480V	200	SC-QSF20-64SN-P	1627	SC-QSF20-64SN-W	1627
	400	SC-QSF40-64SN-P	2071	SC-QSF40-64SN-W	2071
	600	SC-QSF60-64SN-P	2292	SC-QSF60-64SN-W	2292

*Ground Bus Included.

UNDERGROUND PULL SECTION (Without Lugs)

MAIN AMPS	CATALOG NO.	WIDE	LIST PRICE
600	UG1290	12½	$160

SUB-FEED FUSIBLE SWITCHES

AMPERE RATING	2 POLE		3 POLE	
	HEIGHT	LIST PRICE	HEIGHT	LIST PRICE
240 VOLTS A.C. QSF FUSIBLE SWITCHES				
30/30	4X	$104	4X	$139
60/60	4X	104	4X	139
100/100	4X	158	4X	194
100	4X	85	4X	109
200	7X	188	7X	267
400	11X	413	11X	608
600	11X	644	11X	850
480 VOLTS A.C. QSF FUSIBLE SWITCHES				
30/30	4X	152	4X	183
60/60	4X	152	4X	183
100	5X	116	5X	146
600 VOLTS A.C. QSF FUSIBLE SWITCHES				
200	7X	256	7X	340
400	11X	571	11X	784
600	11X	742	11X	935

WEATHERPROOFING

LIST PRICE			
1ST SECTION	ADD'L SECTION	PULL SECTION	
		12½ WIDE	25 WIDE
$487	$367	$194	$367

SCHEDULE PB-2 DISCOUNTS

METER PROVISIONS: Each section provided with socket type or "A" Base mounting provisions, as specified.

C.T. COMPARTMENT: Fully bussed to conform with Power Company specifications. Other configurations available, as required.

UNDERGROUND SERVICE: An underground Pull Section can be joined to either left or right side of section. Refer to table below for selection data.

DIMENSIONS: 90" high x 14¼". All sections 14¼" deep except 1000 and 1200 ampere, 4 wire S/N sections which are 20" or 24" deep and have no wireway.

DISTRIBUTION PANEL SPACE: Space for main and/or sub-feed devices is based on X = 1⅜" multiples. Sections thru 800 amps have 22X spaces: 1000 and 1200 amp Sections have 19X spaces. Total height of main and sub-feed breakers must not exceed this space. Should panel space required exceed space available, select a Service Section and a Distribution Panelboard or Switchboard Section.

Breakers (except M Frame size) are mounted side-by-side. Height shown is for 2 adjoining breakers.

TO ORDER — SPECIFY: Power Co.; Catalog No. of Basic Section; ampere rating of main switch; quantity and ratings of sub-feed breakers; overhead or underground service.

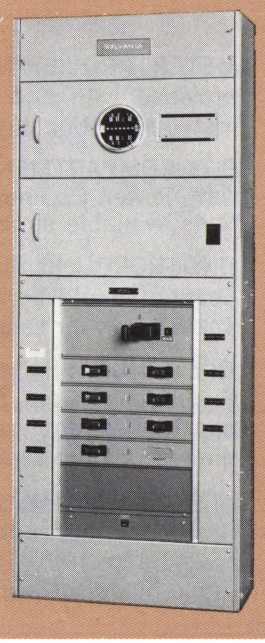
PRICING: Price Basic Section; add price of sub-section feed devices; add price of Underground Pull Section if required.

NOTE: Main breaker may be omitted where local requirements permit six subdivisons of load.

ONE X UNIT OF HEIGHT = 1⅜"

TYPE SC-CBC

TO 1200 AMPERES TO 600 VOLTS A.C.
WITH CIRCUIT BREAKERS
UTILITY METERING SPECIFICATIONS



STYLE P

STYLE W

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

BASIC SECTION WITH MAIN CIRCUIT BREAKER*

SERVICE VOLTAGE	AMPS	STYLE P CATALOG NO.	STYLE P LIST PRICE	STYLE W CATALOG NO.	STYLE W LIST PRICE
1ø, 3W, S/N 120/240V	225	SC-CBC20-3SN-P	$1402	SC-CBC20-3SN-W	$1402
	400	SC-CBC40-3SN-P	1651	SC-CBC40-3SN-W	1651
	600	SC-CBC60-3SN-P	2089	SC-CBC60-3SN-W	2089
	800	SC-CBC80-3SN-P	2575	SC-CBC80-3SN-W	2575
	1000	SC-CBC100-3SN-P	3170	SC-CBC100-3SN-W	3170
	1200	SC-CBC120-3SN-P	3979	SC-CBC120-3SN-W	3979
3ø, 3W 240V & 480V	225	SC-CBC20-63-P	1249	SC-CBC20-63-W	1249
	400	SC-CBC40-63-P	1924	SC-CBC40-63-W	1924
	600	SC-CBC60-63-P	2182	SC-CBC60-63-W	2182
	800	SC-CBC80-63-P	2869	SC-CBC80-63-W	2869
	1000	SC-CBC100-63-P	3600	SC-CBC100-63-W	3600
	1200	SC-CBC120-63-P	4162	SC-CBC120-63-W	4162
3ø, 4W, S/N 120/208V & 277/480V	225	SC-CBC20-4SN-P	1682	SC-CBC20-4SN-W	1682
	400	SC-CBC40-4SN-P	1967	SC-CBC40-4SN-W	1967
	600	SC-CBC60-4SN-P	2597	SC-CBC60-4SN-W	2597
	800	SC-CBC80-4SN-P	3137	SC-CBC80-4SN-W	3137
	1000	SC-CBC100-4SN-P	①6227	SC-CBC100-4SN-W	① 6227
	1200	SC-CBC120-4SN-P	①7039	SC-CBC120-4SN-W	① 7039

UNDERGROUND PULL SECTION

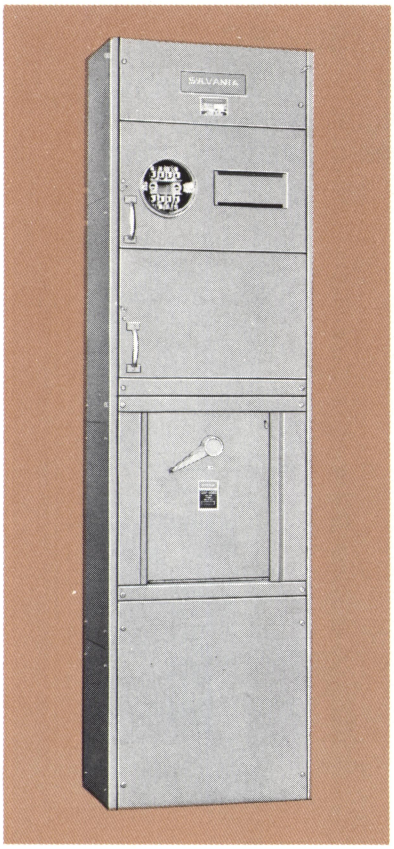
MAIN AMPS	WIDE 3 WIRE	WIDE 4 WIRE	DEEP	LIST PRICE 3 WIRE	LIST PRICE 4 WIRE
800	12½	12½	14¼	$160	$160
1200 ⑤	25	30	14¼	$800	$920

GROUND FAULT PROTECTION (Optional): Add $2413 to List Price and refer to factory for dimensions. **WEATHERPROOFING:** Refer to Page 22 for List Prices.
SCHEDULE PB-2 DISCOUNTS *Ground Bus Included

SUB-FEED CIRCUIT BREAKERS②

AMPERE RATING	FRAME SIZE	2 POLE HEIGHT	2 POLE LIST PRICE	3 POLE HEIGHT	3 POLE LIST PRICE
240 VOLTS A.C.					
15-60	QCB	①	$ 50	...	....
15-50 70 100	QB24	①	58 73 80	①	$ 80 90 102
15-50 70-100	E	3X 3X	64 94	3X 3X	95 122
125-225	QFB	3X	194	4X	248
250-400 500-600	QL	4X③ 4X③	486 789	6X③ 6X③	608 1032
480 VOLTS A.C.					
15-50 70-100	EF	3X 3X	104 134	3X 3X	134 158
600 VOLTS A.C.					
15-50 70-100	EF	3X 3X	119 146	3X 3X	158 183
70-225	FJ	3X	316	3X	395
125-400	JL	6X③	565	6X③	680
125-400	JK	6X③	620	6X③	766
500-600 700-800	M	6X 6X	948 1239	6X 6X	1190 1567
1000 1200	N	6X 6X	1652 2406	6X 6X	1981 2733

①Includes Ground Fault Protection. For 120/208V Sections, deduct $2413 from List Price.
②See Page 33 for Breakers not listed.
③8X spaces required when used as main breaker.
④2 rows of 3 poles = 2X 2 rows of 4 poles = 3X
2 rows of 6 poles = 4X
⑤Lugs and bussing included.



STYLE P

TYPE SC-S

TO 1200 AMPERES TO 600 VOLTS A.C.

FUSIBLE SWITCH MAIN

UTILITY METERING SPECIFICATIONS

METER PROVISIONS: Each Service Section is provided with either socket type or "A" Base meter mounting provisions, as specified.

C.T. COMPARTMENT: Fully bussed to conform with Power Co. requirements. Other configurations available as required.

UNDERGROUND SERVICE: An Underground Pull Section should be added to the order. Refer to Table below for selection data.

DIMENSIONS: Service Sections and Underground Pull Sections are Sylvania standard Uni-Form'd construction and are 90" high by 14" deep. Width dimensions are shown in Tables below.

HORIZONTAL BUS: Service Section can be joined to any 90" high Uni-Form'd Distribution Section . . . interconnected with Horizontal Bus. Refer to Table below for selection data.

STYLE W

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

SERVICE SECTION WITH FUSIBLE SWITCH MAIN*

SERVICE VOLTAGE	AMPS	STYLE P			STYLE W		
		CATALOG NO.	LIST PRICE	WIDE	CATALOG NO.	LIST PRICE	WIDE
1ø, 3W, S/N 120/240V	200	BS20-3SN-P	$1200	25	BS20-3SN-W	$1200	25
	400	BS40-3SN-P	1424	25	BS40-3SN-W	1424	25
	600	BS60-3SN-P	1710	25	BS60-3SN-W	1710	25
	800	BS80-3SN-P	2660	30	BS80-3SN-W	2660	30
	1200	BS120-3SN-P	2960	30	BS120-3SN-W	2960	30
3ø, 3W 240V	200	BS20-33-P	1419	25	BS20-33-W	1419	30
	400	BS40-33-P	1760	25	BS40-33-W	1760	30
	600	BS60-33-P	2057	25	BS60-33-W	2057	30
	800	BS80-33-P	2681	30	BS80-33-W	2681	30
	1200	BS120-33-P	3637	30	BS120-33-W	3637	30
3ø, 3W 600 V	200	BS20-63-P	1492	25	BS20-63-W	1492	30
	400	BS40-63-P	1936	25	BS40-63-W	1936	30
	600	BS60-63-P	2142	25	BS60-63-W	2142	30
	800	BS80-63-P	2681	30	BS80-63-W	2681	30
	1200	BS120-63-P	3637	30	BS120-63-W	3637	30
3ø, 4W, S/N 120/208V	200	BS20-34SN-P	1479	30	BS20-34SN-W	1479	30
	400	BS40-34SN-P	1820	30	BS40-34SN-W	1820	30
	600	BS60-34SN-P	2117	30	BS60-34SN-W	2117	30
	800	BS80-34SN-P	3241	30	BS80-34SN-W	3241	30
	1200	BS120-34SN-P	3747	42	BS120-34SN-W	3747	30
3ø, 4W, S/N 277/480V	200	BS20-64SN-P	1552	30	BS20-64SN-W	1552	30
	400	BS40-64SN-P	1996	30	BS40-64SN-W	1996	30
	600	BS60-64SN-P	2202	30	BS60-64SN-W	2202	30
	800	BS80-64SN-P	3241	30	BS80-64SN-W	3241	30
	1200	BS120-64SN-P	①6230	42	BS120-64SN-W	①6230	42

*Ground Bus Included.

UNDERGROUND PULL SECTION

MAIN AMPS	WIDE		DEEP	LIST PRICE	
	3 W	4 W		3 W	4 W
800	12½	12½	14	$160	$160
1200②	25	30	14	800	970

WEATHERPROOFING

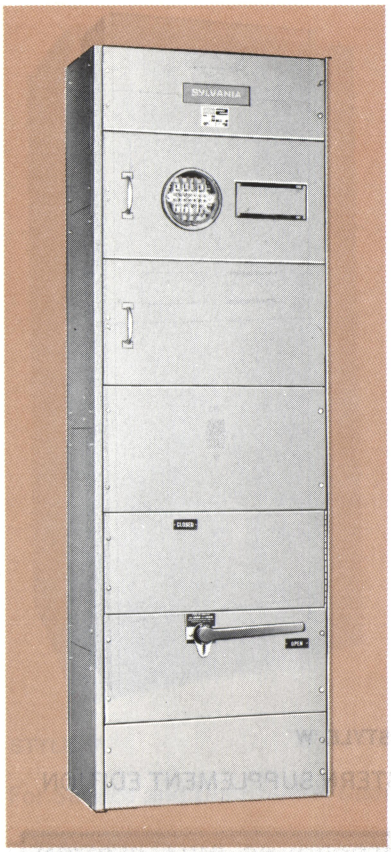
SWBD. WIDTH	SWBD. DEPTH	SECTION	LIST PRICE (ADD)
12½	14	ANY SECTION	$194
25-42	14	1ST SECTION	487
		ADD'L SECTION	367

NOTE: Add 12" to Switchboard Depth for depth of Raintite Enclosure . . . conduits must be located in the back (switchboard depth) area of the pad.

GROUND FAULT PROTECTION (Optional):
Add $2483 to List Price and refer to factory for specifications and dimensions.

① Price includes Ground Fault Protection per NEC. ② Lugs and bussing included.

SCHEDULE PB-2 DISCOUNTS



STYLE P

TYPE SC-BP

1200 TO 4000 AMPERES TO 600 VOLTS A.C.
BOLTED PRESSURE SWITCH MAIN
UTILITY METERING SPECIFICATIONS

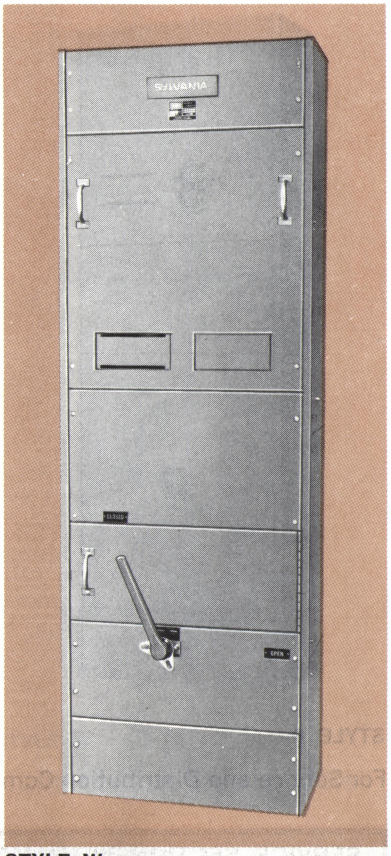
METER PROVISIONS: Each Service Section is provided with either socket type or "A" Base meter mounting provisions, as specified.

C.T. COMPARTMENT: Fully bussed to conform with Power Co. requirements. Other configurations available as required.

UNDERGROUND SERVICE: An Underground Pull Section should be added to the order. Refer to Table below for selection data.

DIMENSIONS: Service Sections and Underground Pull Sections are Sylvania standard Uni-Form'd construction and are 90" high. Width and depth dimensions are shown in Tables below.

HORIZONTAL BUS: Service Section can be joined to any 90" high Uni-Form'd Distribution Section . . . interconnected with Horizontal Bus. Refer to Table below for selection data.



STYLE W

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

SERVICE SECTION WITH BOLTED PRESSURE SWITCH MAIN*

SERVICE VOLTAGE	AMPS	DEEP	STYLE P CATALOG NO.	STYLE P LIST PRICE	STYLE P WIDE	STYLE W CATALOG NO.	STYLE W LIST PRICE	STYLE W WIDE
1ø, 3W, S/N 120/240V	1200	24	BP120-3SN-P	$4025	30	BP120-3SN-W	$4025	30
	1600	24	BP160-3SN-P	4450	30	BP160-3SN-W	4450	42
3ø, 3W 240V	1200	24	BP120-33-P	4900	30	BP120-33-W	4900	42
	1600	24	BP160-33-P	5500	30	BP160-33-W	5500	42
	2000	24	BP200-33-P	6200	30	BP200-33-W	6200	42
	2500	36	BP250-33-P	7850	42	BP250-33-W	7850	42
	3000	36	BP300-33-P	9700	42	BP300-33-W	9700	42
	4000	48	BP400-33-P	12550	42	BP400-33-W	12550	50
3ø, 3W 480V	1200	24	BP120-63-P	5875	30	BP120-63-W	5875	30
	1600	24	BP160-63-P	6475	30	BP160-63-W	6475	42
	2000	24	BP200-63-P	7150	30	BP200-63-W	7150	42
	2500	36	BP250-63-P	8400	42	BP250-63-W	8400	42
	3000	36	BP300-63-P	11800	42	BP300-63-W	11800	42
	4000	48	BP400-63-P	15650	42	BP400-63-W	15650	50
3ø, 4W, S/N 120/208V & 120/240V	1200	24	BP120-34SN-P	5025	42	BP120-34SN-W	5025	30
	1600	24	BP160-34SN-P	5625	42	BP160-34SN-W	5625	42
	2000	24	BP200-34SN-P	6300	42	BP200-34SN-W	6300	42
	2500	36	BP250-34SN-P	8050	42	BP250-34SN-W	8050	42
	3000	36	BP300-34SN-P	9950	42	BP300-34SN-W	9950	42
	4000	48	BP400-34SN-P	12800	60	BP400-34SN-W	12800	50
3ø, 4W, S/N 277/480V	1200	24	BP120-64SN-P	①10100	42	BP120-64SN-W	①10100	35
	1600	24	BP160-64SN-P	①10700	42	BP160-64SN-W	①10700	42
	2000	24	BP200-64SN-P	①11400	42	BP200-64SN-W	①11400	42
	2500	36	BP250-64SN-P	①13100	42	BP250-64SN-W	①13100	42
	3000	36	BP300-64SN-P	①16500	42	BP300-64SN-W	①16500	48
	4000	48	BP400-64SN-P	①20400	60	BP400-64SN-W	①20400	50

*Ground Bus Included

UNDERGROUND PULL SECTION

MAIN AMPS	WIDE 3 W	WIDE 4 W	DEEP	LIST PRICE 3 W	LIST PRICE 4 W
1200	25	30	14	$ 800	$ 920
1600	30	35	24	1021	1155
2000	30	35	24	1215	1336
2500	30	35	36	1398	1579
3000	30	35	36	1677	1884
4000	Consult Factory			2181	2430

WEATHERPROOFING

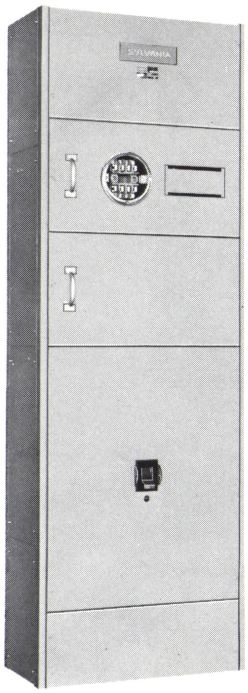
SWBD. WIDTH	SWBD. DEPTH	SECTION	LIST PRICE (ADD)
30-42	24	1ST SECT.	$487
		ADD'L SECT.	367
42	36	1ST SECT.	728
		ADD'L SECT.	516
50-60	48	1ST SECT.	1582
		ADD'L SECT.	1215

NOTE: Add 12" to Switchboard Depth for depth of Raintite Enclosure . . . conduits must be located in the back (switchboard depth) area of the pad. Consult Factory for sizes not listed above.

GROUND FAULT PROTECTION:

①All 277/480V Sections include GFP per the NEC. If GFP required on other voltage ratings add $4100 for 1200-2000A and $4470 for 2500-4000A.

SCHEDULE PB-2 DISCOUNTS



STYLE P

TYPE SC-B

TO 2500 AMPERES TO 600 VOLTS A.C.

MOLDED CASE CIRCUIT BREAKER MAIN

UTILITY METERING SPECIFICATIONS

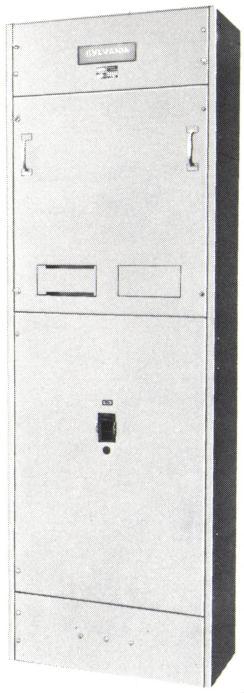
METER PROVISIONS: Each Service Section is provided with either socket type or "A" Base meter mounting provisions, as specified.

C.T. COMPARTMENT: Fully bussed to conform with Power Co. requirements. Other configurations available as required.

UNDERGROUND SERVICE: An Underground Pull Section should be added to the order. Refer to Table below for selection data.

DIMENSIONS: Service Sections and Underground Pull Sections are Sylvania standard Uni-Form'd construction and are 90" high. Width and depth dimensions are shown in Tables below.

HORIZONTAL BUS: Service Section can be joined to any 90" high Uni-Form'd Distribution Section . . . interconnected with Horizontal Bus. Refer to Table below for selection data.



STYLE W

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

SERVICE SECTION WITH MAIN BREAKER*

SERVICE VOLTAGE	AMPS	DEEP	STYLE P CATALOG NO.	STYLE P LIST PRICE	STYLE P WIDE	STYLE W CATALOG NO.	STYLE W LIST PRICE	STYLE W WIDE
1Ø, 3W, S/N 120/240V	225	14	BB20-3SN-P	$ 1327	25	BB20-3SN-W	$ 1327	25
	400	14	BB40-3SN-P	1576	25	BB40-3SN-W	1576	25
	600	14	BB60-3SN-P	2014	25	BB60-3SN-W	2014	25
	800	14	BB80-3SN-P	2500	25	BB80-3SN-W	2500	25
	1000	14	BB100-3SN-P	3095	30	BB100-3SN-W	3095	25
	1200	14	BB120-3SN-P	3904	30	BB120-3SN-W	3904	25
	1600	24	BB160-3SN-P	5534	30	...	...	...
3Ø 3W 240V & 480V	225	14	BB20-63-P	1547	25	BB20-63-W	1547	25
	400	14	BB40-63-P	1832	25	BB40-63-W	1832	25
	600	14	BB60-63-P	2412	25	BB60-63-W	2412	25
	800	14	BB80-63-P	2987	25	BB80-63-W	2987	25
	1000	14	BB100-63-P	2624	30	BB100-63-W	2624	30
	1200	14	BB120-63-P	4426	30	BB120-63-W	4426	30
	1600	24	BB160-63-P	6759	30	BB160-63-W	6759	30
	2000	24	BB200-63-P	7376	30	BB200-63-W	7376	30
	2500	36	BB250-63-P	12171	30	BB250-63-W	12171	30
	3000	36	BB300-63-P	20066	30	BB300-63-W	20066	42
	4000	48	BB400-63-P	29528	30	BB400-63-W	29528	42
3Ø 4W, SN 120/208V & 277/480V	225	14	BB20-6SN-P	1607	30	BB20-6SN-W	1607	30
	400	14	BB40-6SN-P	1892	30	BB40-6SN-W	1892	30
	600	14	BB60-6SN-P	2472	30	BB60-6SN-W	2472	30
	800	14	BB80-6SN-P	3047	30	BB80-6SN-W	3047	30
	1000	14	BB100-6SN-P	① 6137	42	BB100-6SN-W	6137	42
	1200	14	BB120-6SN-P	① 6949	42	BB120-6SN-W	① 6949	42
	1600	24	BB160-6SN-P	① 9450	42	BB160-6SN-W	① 9450	42
	2000	24	BB200-6SN-P	①10077	42	BB200-6SN-W	①10077	42
	2500	36	BB250-6SN-P	①15302	42	BB250-6SN-W	①15302	42
	3000	36	BB300-6SN-P	①23217	42	BB300-6SN-W	①23217	42
	4000	48	BB400-6SN-P	①32729	42	BB400-6SN-W	①32729	42

*Ground Bus Included.

UNDERGROUND PULL SECTION

MAIN AMPS	WIDE 3 W	WIDE 4 W	DEEP	LIST PRICE 3 W	LIST PRICE 4 W
800	12½	12½	14	$ 160	$ 160
1200	25	30	14	800	920
1600	30	35	24	1021	1155
2000	30	35	24	1215	1336
2500	30	35	36	1398	1579
3000	30	35	36	1677	1884
4000	Consult Factory			2181	2430

WEATHERPROOFING

SWBD. WIDTH	SWBD. DEPTH	SECTION	LIST PRICE (ADD)
12½	14	ANY SECTION	$194
25-42	14	1ST SECTION	487
		ADD'L SECTION	367
25-42	24	1ST SECTION	728
		ADD'L SECTION	516
25-42	36	1ST SECTION	1582
		ADD'L SECTION	1215

NOTE: Add 12" to Switchboard Depth for depth of Raintite Enclosure . . . conduits must be located in the back (switchboard depth) area of the pad.

GROUND FAULT PROTECTION:

①GFP included in price for 277/480V Sections to meet the NEC . . . for 120/208V when no GFP specified deduct as follows: 1000-1200A $2413, 1500-2000A $2561, 2500-4000A $2931

Add these amounts to other ratings when GFP specified.

SCHEDULE PB-2 DISCOUNTS

TYPE SC-AB

1200 TO 4000 AMPERES TO 600 VOLTS A.C.

AIR CIRCUIT BREAKER MAIN

UTILITY METERING SPECIFICATIONS

STYLE P

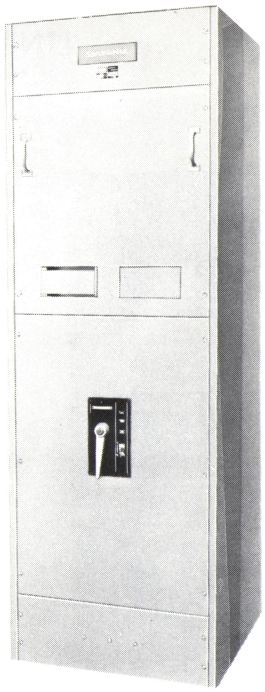
METER PROVISIONS: Each Service Section is provided with either socket type or "A" Base meter mounting provisions, as specified.

C.T. COMPARTMENT: Fully bussed to conform with Power Co. requirements. Other configurations available as required.

UNDERGROUND SERVICE: An Underground Pull Section should be added to the order. Refer to Table below for selection data.

DIMENSIONS: Service Sections and Underground Pull Sections are Sylvania standard Uni-Form'd construction and are 90" high. Width and depth dimensions are shown in Tables below.

HORIZONTAL BUS: Service Section can be joined to any 90" high Uni-Form'd Distribution Section . . . interconnected with Horizontal Bus. Refer to Table below for selection data.



STYLE W

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

SERVICE SECTION WITH AIR CIRCUIT BREAKER MAIN*

SERVICE VOLTAGE	AMPS	DEEP	STYLE P			STYLE W		
			CATALOG NO.	LIST PRICE	WIDE	CATALOG NO.	LIST PRICE	WIDE
1Ø, 3W, S/N	1200	30	SCAB120-3SN-P	$6950	30	SCAB120-3SN-W	$6950	30
120/240V ①	1600	30	SCAB160-3SN-P	7250	30	SCAB160-3SN-W	7250	42
3Ø, 3W 208V 240V 480V ①	1200	30	SCAB120-63-P	7750	30	SCAB120-63-W	7750	30
	1600	30	SCAB160-63-P	8100	30	SCAB160-63-W	8100	42
	2000	42	SCAB200-63-P	19150	35	SCAB200-63-W	19150	42
	3000	42	SCAB300-63-P	20000	35	SCAB300-63-W	20000	42
	4000	48	SCAB400-63-P	29500	42	SCAB400-63-W	29500	50
3Ø, 4W, S/N 120/208V 120/240V 277/480V ②	1200	30	SCAB120-4SN-P	10450	42	SCAB120-4SN-W	10450	35
	1600	30	SCAB160-4SN-P	10850	42	SCAB160-4SN-W	10850	42
	2000	42	SCAB200-4SN-P	21950	42	SCAB200-4SN-W	21950	42
	3000	42	SCAB300-4SN-P	22900	42	SCAB300-4SN-W	22900	42
	4000	48	SCAB400-4SN-P	32500	60	SCAB400-4SN-W	32500	50

*Ground Bus Included.

UNDERGROUND PULL SECTION

MAIN AMPS	WIDE 3 W	WIDE 4 W	DEEP	LIST PRICE 3 W	LIST PRICE 4 W
1200	25	30	14	$ 800	$ 920
1600	30	35	24	1021	1155
2000	30	35	24	1215	1336
2500	30	35	36	1398	1579
3000	30	35	36	1677	1884
4000	Consult Factory			2181	2430

WEATHERPROOFING

SWBD. WIDTH	SWBD. DEPTH	SECTION	LIST PRICE (ADD)
30-42	30	1ST SECTION	$728
		ADD'L SECTION	516
60	48	1ST SECTION	1582
		ADD'L SECTION	1215

NOTE: Add 12" to Switchboard Depth for depth of Raintite Enclosure . . . conduits must be located in the back (switchboard depth) area of the pad. Consult Factory for sizes not listed above.

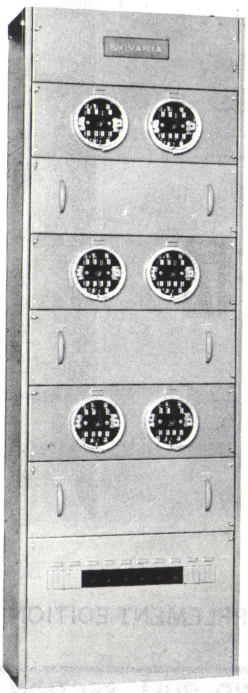
GROUND FAULT PROTECTION:

①Add $2603 to List Price and refer to factory for specifications and dimensions.

②All 3Ø, 4W Sections include Ground Fault Protection. For 120/208V Sections, deduct $2603 from List Price.

SCHEDULE PB-2 DISCOUNTS

UNI-FORM'D MULTIPLE METER SERVICE SECTIONS



TYPE SC-MMC
FOR COMMERCIAL INSTALLATIONS
UTILITY METERING SPECIFICATIONS

1Ø, 3 WIRE S/N
120/240 VOLTS

3Ø, 4 WIRE S/N
120/208 VOLTS
277/480 VOLTS

3Ø, 3 WIRE
240 VOLTS
480 VOLTS

These Service Centers are assembled to conform with utility specifications. A main service disconnect must be used when more than six subdivisions of load are required at 240 volts or more than one at 480 volts.

When a main disconnect is used, enclosures are bolted together and sections interconnected with horizontal bussing. Refer to pages 6 thru 9 for Main Service Sections.

SC-MMC Sections are designed for out-the-bottom load wiring. If load wiring must go out the top, a Pull Section should be added.

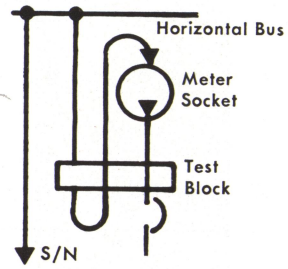
Each section is furnished complete with meter sockets; mounting for test blocks; solid neutral bars, when required; loop wiring from bus to meter sockets to breakers or switches; and 800 ampere horizontal bus. 1200, 1600 and 2000 amp bus also available, if required.

DIMENSIONS

800-1200 Amp Section: 30″ W x 90″ H x 14″ D
1600-2000 Amp Section: 30″ W x 90″ H x 20″ D
800 Amp Pull Section: 12½″ W x 90″ H x 14″ D
2000 Amp Pull Section: 36″ W x 90″ H x 20″ D

TYPE SC-MM10
100 AMPERE METER SOCKETS
TYPES QB OR EF CIRCUIT BREAKERS
TYPE QSF FUSIBLE SWITCHES

TYPE SC-MM20
200 AMPERE METER SOCKETS
TYPES QFB OR FJ CIRCUIT BREAKERS
TYPE QSF FUSIBLE SWITCHES



Typical Line Wiring Diagram

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

MULTIPLE METER SERVICE SECTION					COMMERCIAL
SYSTEM	VOLTAGE	AMPERE RATING	MAX. SOCKETS WITH BREAKERS	MAX. SOCKETS WITH SWITCHES	TYPE
1φ, 3W, S/N	120/240 V	100 200	6 4	4 2	SCMM10-3SN SCMM20-3SN
3φ, 4W, S/N	120/208 V	100 200	6 4	4 2	SCMM10-4SN SCMM20-4SN
3φ, 4W, S/N	277/480 V	100 200	6 4	4 2	SCMM10-480SN SCMM20-480SN
3φ, 3W	240 V	100 200	6 4	4 2	SCMM10-240 SCMM20-240
3φ, 3W	480 V	100 200	6 4	4 2	SCMM10-480 SCMM20-480

Consult Factory for Pricing Data.

UNI-FORM'D MULTIPLE METER SERVICE SECTIONS

TYPE SC-MMR

FOR RESIDENTIAL INSTALLATIONS

UTILITY METERING SPECIFICATIONS

1Ø, 3 WIRE S/N
120/240 VOLTS

3Ø, 4 WIRE S/N
120/208 VOLTS

Specifications:

The Service Section(s) for (lighting) (power) (lighting and power) shall be suitable for (underground) (overhead) service from _____ Power Company's lines and shall be Sylvania Type SC-MMR.

The Service Section(s) shall contain space and mounting facilities for the power company's meters in the ampere ratings and quantities as shown on the plans and shall also contain the required solid neutral bars.

Branch disconnects shall be (Sylvania Type QB, EF, QFB or FJ molded case quick make-quick break, thermal-magnetic circuit breakers) (Sylvania Type QSF quick make—quick break fusible switches) in ratings and quantities as shown on the plans.

The main disconnect, when required, shall be installed in an enclosure to match the service section(s). Enclosures shall be bolted together and electrically connected by horizontal bus bar to form a complete assembly.

FOR UNDERGROUND SERVICE: An Underground Service Pull Section complying with power company's requirements shall be furnished for each service as shown on plans.

TYPE SC-MMR10
100 AMPERE METER SOCKETS
TYPES QB OR EF CIRCUIT BREAKERS
TYPE QSF FUSIBLE SWITCHES

TYPE SC-MMR20
200 AMPERE METER SOCKETS
TYPES QFB OR FJ CIRCUIT BREAKERS
TYPE QSF FUSIBLE SWITCHES

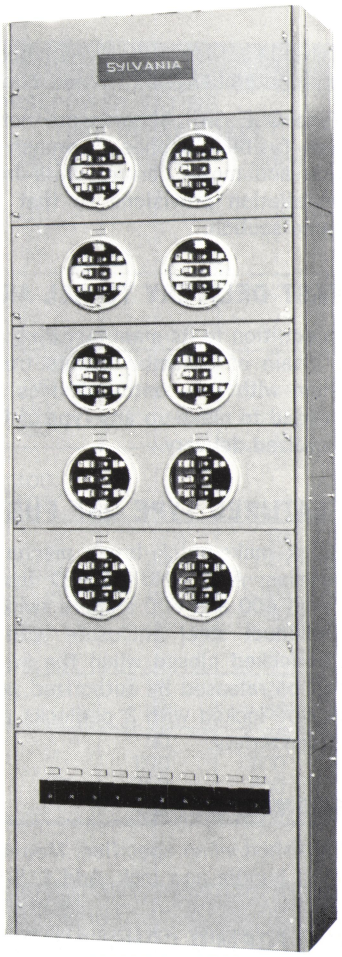
These Service Centers are assembled with up to 10 meter/disconnect service branches in one floor standing enclosure and are designed to conform with utility specifications. A main service disconnect must be used when more than six subdivisions of load are required.

When a main disconnect is used, enclosures are bolted together and sections interconnected with 1200 ampere horizontal bussing.

Type SC-MMR Sections are designed for out-the-bottom load wiring. If load wiring must go out the top, a Pull Section should be added.

Each section is furnished complete with meter sockets, solid neutral bars, and circuit breaker or fusible switch branch disconnect devices. Meter sockets have provisions for field installation of manual by-pass and for a 5th jaw at the 3, 6 or 9 o'clock position.

DIMENSIONS
Service Section or Pull Section
30″ Wide x 90″ High x 14″ Deep



TYPE SCMMR10-3SN

For Service and Distribution Combinations built to Western utility standards refer to WESTERN SUPPLEMENT EDITION

MULTIPLE METER SERVICE SECTION					RESIDENTIAL
SYSTEM	**VOLTAGE**	**AMPERE RATING**	**TYPE BRANCHES**	**MAX. SOCKETS**	**CATALOG NO.**
1φ, 3W, S/N	120/240V	100	QB BREAKER EF BREAKER SWITCH	10 8 6	SCMMR10-3SN
		200	QFB BREAKER FJ BREAKER QSF SWITCH	8 6 4	SCMMR20-3SN
3φ, 4W, S/N	120/208V	100	QB BREAKER EF BREAKER SWITCH	10 8 6	SCMMR10-4SN
		200	QFB BREAKER FJ BREAKER QSF SWITCH	8 6 4	SCMMR20-4SN

Consult Factory for Pricing Data.

TYPE QSF CONVERTIBLE SWITCHBOARDS

MAIN BUS TO 4000 AMPERES 600 VOLTS A.C.

Combines Switches, Breakers, Motor Control Units in the same Switchboard

Sylvania's Distribution Switchboards are almost unlimited in their interchangeability and convertibility.

Type QSF Switchboards are not limited to the installation of only fusible switches — branch circuit breakers from the CBC line and motor control units from the CMC line have similar installation provisions so that they can be combined in the same section.

TYPE QSF

FAST DELIVERY TO ALL AREAS

In addition to its manufacturing plants, Sylvania has established a chain of assembly plants from coast to coast and stocked them with the control devices and standard component parts needed to make-up any type of Uni-Form'd Switchboard for fast, localized delivery.

FEATURES TYPE QSF FUSIBLE SWITCHES

Quick make-quick break mechanism; horsepower rated; rotary handles; AIR-CONDITIONED fuse clips (A Sylvania Exclusive) on all 400 and 600 ampere switches. Each unit is housed in an individual steel enclosure with hinged cover. Each cover is interlocked closed when the switch is in the ON position but can be released by authorized personnel for inspection. Handle can be locked with 3 padlocks and cover can be padlocked for added safety.

FORMED DOOR

Furnished when specified. Mounted with piano hinge — 3 point vault handle and lock. Add $150 to list price.

UNI-FORM'D CONSTRUCTION

Each section completely enclosed and self-contained in a self-supporting, floor standing cubicle. Sections can be installed individually, in conjunction with a Service Section or joined together with other sections by horizontal bussing. Removable cover plates permit top, bottom, side or back entrance or exit of cables.

DIMENSIONS

MAIN AMPERES	INDOOR			WEATHERPROOF		
	WIDE	HIGH	DEEP	WIDE	HIGH	DEEP
200-1200	35	90	14	35	90	25
1600-2000	35	90	24	35	90	36
2500	35	90	30	35	90	42
3000	35	90	36	35	90	48
4000	35	90	48	35	90	60

AVAILABLE PANEL SPACE

Switches, breakers and motor control units are dimensioned to the same "X" height multiple to permit interchangeability and to provide for easy future additions or changes in the field. The table below indicates the available panel space for devices. If the "X" units required exceed these figures, two or more sections must be used.

SECTION X SPACE
Western Utility Designs — 44X maximum

AMPERE RATING MAIN BUS	DISTRIBUTION SECTION POWER INPUT(1)			
	MAIN LUGS(2)		MAIN SW/CB OR CROSS-BUS(3)	
	W/NEUTRAL	NO NEUTRAL	W/NEUTRAL	NO NEUTRAL
400	46	48	47	49
600	45	47	47	49
800	45	47	47	49
1000	39	44	44	49
1200	39	44	44	49
1600	31	39	41	49
2000	31	39	41	49
2500	(4)	(4)	(4)	49
3000	(4)	(4)	(4)	49
4000	(4)	(4)	(4)	49

(1) Front accessibility only. If rear is accessible, 49X units available for all types.
(2) Using standard screw-type lugs, if compression (or crimp) type lugs are required, deduct 3X from available space thru 1200 Amp, and 6X for 1600A and 2000A ratings.
(3) Figure does not include "X" unit height required for Main Switch or Circuit Breaker.
(4) Front accessibility only not practical on large sizes, refer to factory for available space.

BASE LIST PRICE①

AMPERE RATING	PHASE			
	1Ø, 2W	1Ø, 3W	3Ø, 3W	3Ø, 4W
400	$455	$515	$540	$600
600	510	570	610	670
800	660	720	760	820
1000	770	865	920	1020
1200	810	920	970	1080
1600	980	1110	1170	1300
2000	1090	1230	1300	1440
2500	....	....	1850	2050
3000	....	....	2100	2320
4000	....	....	2530	2800

① Use once per Section.

ADDITIONAL FEATURES

ITEM	PHASE	AMPERE RATING OF MAINS									
		200	400	600	800	1200	1600	2000	2500	3000	4000
SPLIT BUS	1Ø	$ 78	$ 97	$110	$146	$183	$248	$280			
	3Ø	97	110	121	164	206	285	316	$400	$431	$546
GROUND BUS	ANY	152	152	152	152	152	152	152	152	152	152
WEATHERPROOFING: 1ST SECTION		487	487	487	487	487	487	487	728	728	1582
ADD'L SECTION		367	367	367	367	367	367	367	516	516	1215

QSF — MAIN OR BRANCH SWITCHES

VOLTS	AMPERE RATING	CATALOG NO.	LIST PRICE		HEIGHT	HORSEPOWER RATING			
			SWITCH	SPACE		N.E.C. STD.	TIME DELAY FUSES		
							240V	480V	600V
240 VOLTS 2 POLE	30/30	QSF-T332B	$ 104	$ 49	4X	1½	3	...	...
	60/60	QSF-T632B	104	49	4X	3	10	...	...
	100/100	QSF-T1032B	158	49	4X	7½	15	...	...
	100	QSF-1032B	85	49	4X	7½	15	...	...
	200	QSF-2032B	188	85	7X	15	...	...	...
	400	QSF-4032	413	134	11X	...	...	...	...
	600	QSF-6032	644	134	11X	...	...	...	...
240 VOLTS 3 POLE	30/30	QSF-T333B	139	49	4X	3	7½	...	...
	60/60	QSF-T633B	139	49	4X	7½	15	...	...
	100/100	QSF-T1033B	194	49	4X	15	30	...	...
	100	QSF-1033B	109	49	4X	15	30	...	...
	200	QSF-2033B	267	85	7X	25	...	...	...
	400	QSF-4033	608	134	11X	50	100	...	...
	600	QSF-6033	850	134	11X	75	100	...	...
480 & 600 VOLTS 2 POLE	30/30	QSF-T352B	152	49	4X	3	...	7½	10
	60/60	QSF-T652B	152	49	4X	5	...	20	25
	100	QSF-1052B	116	60	5X	10	...	...	40
	200	QSF-2052B	256	85	7X	...	...	...	50
	400	QSF-4052	571	134	11X	...	...	...	...
	600	QSF-6052	742	134	11X	...	...	...	...
480 & 600 VOLTS 3 POLE	30/30	QSF-T353B	183	49	4X	5	...	15	20
	60/60	QSF-T653B	183	49	4X	15	...	30	50
	100	QSF-1053B	146	60	5X	25	...	50	50
	200	QSF-2053B	340	85	7X	60	...	100	100
	400	QSF-4053	784	134	11X	100	...	250	350
	600	QSF-6053	935	134	11X	100	...	400	500

LAYOUT DATA

240V		SWITCH HEIGHT	600V	
2P	3P		2P	3P
4X	4X	30A 30A	4X	4X
4X	4X	60A 60A	4X	4X
4X	4X	100A 100A	4X	4X
4X	4X	100A	5X	5X
7X	7X	200A	7X	7X
11X	11X	400A	11X	11X

List volts, amps and phase; Specify Main Lugs or Main Switch and bus rating; and itemize branch switches.

To Base List Price, add price of Main Switch (when needed) Branch Switches and Breakers, Motor Control Units, Spaces, and Special Features. Total will show price of switchboard.

If total height needed exceeds the available space, another section must be used and priced.

ONE X UNIT OF HEIGHT = 1⅜"

QSF EXAMPLE

120/208 Volts — 3Ø, 4W, S/N

S/N		
	FILLER PLATE	
4X	30A-2P	30A-2P
4X	60A-3P	60A-3P
4X	100A-3P	100A-3P
4X	100A-3P SPACE	100A-3P SPACE
7X	200A-3P	
7X	200A-3P	
7X	200A-3P SPACE	
	MAIN LUGS	

37X (45X available)

Ground Bus	$152
Filler Plate Height determined by unused space in panel	
Twin 30/30A 2 Pole QSF-T332	104
Twin 60/60A 3 Pole QSF-T633	139
Twin 100/100A 3 Pole QSF-T1033	194
Twin 100A 3 Pole Space	49
200A 3 Pole QSF-2033	267
200A 3 Pole QSF-2033	267
200A 3 Pole Space	85
800A Main Lugs	Incl.
800 Base List Price	820
Total List Price	$2077

TYPE CBC CONVERTIBLE SWITCHBOARDS

MAIN BUS TO 4000 AMPERES TO 600 VOLTS A.C. — 250 VOLTS D.C.

Combines Breaker, Switches, Motor Control Units in the same Switchboard

Sylvania's Distribution Switchboards are almost unlimited in their interchangeability and convertibility.

Type CBC Switchboards are not limited to the installation of only circuit breakers — fusible switches from the QSF line and motor control units from the CMC line have similar installation provisions so that they can be combined in the same section.

FAST DELIVERY TO ALL AREAS

In addition to its manufacturing plants, Sylvania has established a chain of assembly plants from coast to coast and stocked them with the control devices and standard component parts needed to make-up any type of Uni-Form'd Switchboard for fast, localized delivery.

FEATURES CIRCUIT BREAKERS

Quick make-quick break, common trip molded case frames thru 1200 amperes. Refer to table on Page 26, Section 106 of the Engineering Manual for interrupting capacity ratings. Breakers can be removed from the front of switchboard without disturbing adjacent units. Mounting plates and bus bar connectors are standardized so that breakers can be removed, changed or readily converted within their frame size. Formed plates cover the surface of all breakers to provide an attractive, modern appearance.

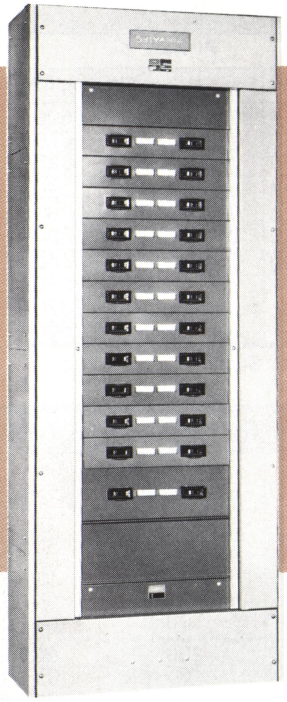
FORMED DOOR

Furnished when specified. Mounted with piano hinge — 3 point vault handle and lock. Add $150 to list price.

BREAKER SPACE HEIGHTS

E, EF, FJ, FK, JL, JK and 400 amp frame QL breakers are mounted by pairs — 1 height space will hold 2 devices. 600 amp frame QL and all M, N, HM and HN breakers each require 1 full height space.

DIMENSIONS						
MAIN AMPERES	INDOOR			WEATHERPROOF		
	WIDE	HIGH	DEEP	WIDE	HIGH	DEEP
200-1200	35	90	14	35	90	25
1600-2000	35	90	24	35	90	36
2500	35	90	30	35	90	42
3000	35	90	36	35	90	48
4000	35	90	48	35	90	60



TYPE CBC

AVAILABLE PANEL SPACE

Switches, breakers and motor control units are dimensioned to the same "X" height multiple to permit interchangeability and to provide for easy future additions or changes in the field. The table below indicates the available panel space for devices. If the "X" units required exceed these figures, two or more sections must be used.

SECTION X SPACE

Western Utility Designs — 44X maximum

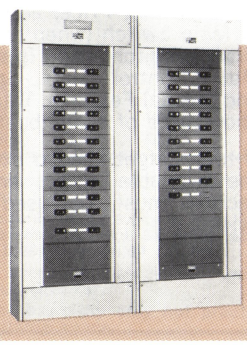
AMPERE RATING MAIN BUS	DISTRIBUTION SECTION POWER INPUT(1)			
	MAIN LUGS(2)		MAIN SW/CB OR CROSS-BUS(3)	
	W/NEUTRAL	NO NEUTRAL	W/NEUTRAL	NO NEUTRAL
400	46	48	47	49
600	45	47	47	49
800	45	47	47	49
1000	39	44	44	49
1200	39	44	44	49
1600	31	39	41	49
2000	31	39	41	49
2500	(4)	(4)	(4)	49
3000	(4)	(4)	(4)	49
4000	(4)	(4)	(4)	49

(1) Front accessibility only. If rear is accessible, 49X units available for all types.

(2) Using standard screw-type lugs, if compression (or crimp) type lugs are required, deduct 3X from available space thru 1200 Amp, and 6X for 1600A and 2000A ratings.

(3) Figure does not include "X" unit height required for Main Switch or Circuit Breaker.

(4) Front accessibility only not practical on large sizes, refer to factory for available space.



HINGED FRONT PLATES
Cover Wiring Gutter

BASE LIST PRICE①

AMPERE RATING	PHASE			
	1Ø, 2W	1Ø, 3W	3Ø, 3W	3Ø, 4W
400	$455	$515	$540	$600
600	510	570	610	670
800	660	720	760	820
1000	770	865	920	1020
1200	810	920	970	1080
1600	980	1110	1170	1300
2000	1090	1230	1300	1440
2500	....	....	1850	2050
3000	....	....	2100	2320
4000	....	....	2530	2800

① Use once per Section.

ADDITIONAL FEATURES

ITEM	PHASE	AMPERE RATING OF MAINS								
		200	400	600	800	1200	1600	2000	2500	3000	4000
SPLIT BUS	1Ø	$ 78	$ 97	$110	$146	$183	$248	$280			
	3Ø	97	110	121	164	206	285	316	$400	$431	$546
GROUND BUS	ANY	152	152	152	152	152	152	152	152	152	152
WEATHERPROOFING: 1ST SECTION		487	487	487	487	487	487	487	728	728	1582
ADD'L SECTION		367	367	367	367	367	367	367	516	516	1215

MAIN OR BRANCH BREAKERS

TYPE	AMPERE RATING	POLES	LIST PRICE			HEIGHT
			BREAKER	SPACE	FUTURE PROV	
QB	15-50 • 120/240V	1	$25	$ 7	$ 13	①
	②15-30 • 277V	1	37	7	13	
	60 • 120/240V	2	50	13	22	2X
	60 • 240V	2	58	13	22	2X
	70 • 240V	2	73	13	22	2X
	100 • 240V	2	80	13	22	2X
	15-50 • 240V	3	80	13	22	2X
	70 • 240V	3	90	13	22	2X
	100 • 240V	3	102	13	22	2X
E	15-50	1	35	7	13	①
	240V	2	64	19	26	3X
		3	95	19	30	3X
	70-100	2	94	19	26	3X
	240V	3	122	19	30	3X
EF②	15-50 • 277V	1	39	7	13	①
EF	15-50	2	104	19	26	3X
	480V	3	134	19	30	3X
	70-100	2	134	19	26	3X
	480V	3	158	19	30	3X
	15-50	2	119	19	26	3X
	600V	3	158	19	30	3X
	70-100	2	146	19	26	3X
	600V	3	183	19	30	3X
QFB	125-225	2	194	19	36	3X
	240V	3	248	26	50	4X
QL	250-400	2	486	26	56	4X⑤
	240V	3	608	39	78	6X⑤
	500-600	2	789	52	98	4X⑤
	240V	3	1032	78	134	6X⑤
FJ	70-225	2	316	19	36	3X
	600V	3	395	19	50	3X
FK③	125-225	2	395	19	36	3X
	600V	3	462	19	50	3X
JL	125-400	2	565	39	56	6X
	600V	3	680	39	78	6X
JK③	125-400	2	620	39	56	6X
	600V	3	766	39	78	6X
M③	500-600	2	948	78	98	6X
	600V	3	1190	78	134	6X
	700-800	2	1239	78	127	6X
	600V	3	1567	78	170	6X
N ③	1000	2	1652	78	188	6X
	600V	3	1981	78	256	6X
	1200	2	2406	78	188	6X
	600V	3	2733	78	256	6X

65,000 AMPERES SYM RMS AT 240V

TYPE	AMPERE RATING	POLES	LIST PRICE			HEIGHT
			BREAKER	SPACE	FUTURE PROV	
HEF	②15-50 • 277V	1	$ 78	$ 7	$ 13	①
	15-50 • 600V	2	183	19	26	3X
		3	213	19	30	3X
	70-100	2	201	19	26	3X
	600V	3	238	19	30	3X
HFJ	70-225	2	692	19	36	3X
	600V	3	838	19	50	3X
HJL	125-400	2	935	39	56	6X
	600V	3	1142	39	78	6X
HM ③	500-600	2	1191	78	98	6X
	600V	3	1456	78	134	6X
	800	2	1518	78	127	6X
	600V	3	1871	78	170	6X
HN ③	1000	2	1907	78	188	6X
	600V	3	2224	78	256	6X
	1200	2	2613	78	188	6X
	600V	3	2856	78	256	6X

CBC EXAMPLE

120/208V., 3Ø 4 Wire, S/N

	S/N
	FILLER PLATE
3X	30A-2P (2) E Frame
9X	100A-3P (6) E Frame
3X	100A-3P (2) E Prov.
3X	225A-3P (2) FJ Frame
6X	400A-3P (2) JL Frame
6X	400A-3P (2) JL Prov.
6X	800A-3P M Frame Main
	END COVER

36X (47X available)

Filler Plate Height determined by unused space in panel.

	Incl.
2—30A 2P E @ $64	$ 128
6—100A 3P E @ $122	732
2—100A 3P E Prov. @ $30	60
2—225A 3P FJ @ $395	790
2—400A 3P JL @ $680	1360
2—400A 3P JL Prov. @ $78	156
800A 3P M Frame	1567
800A Base List Price	820
Total List Price	$5613

②For 277/480 Volts, 3Ø, 4W, SN. ①See page 14 for Space Heights.

③With Interchangeable Trip. ⑤8X spaces required when used as main.

For Circuit Breaker Characteristics See Page 43

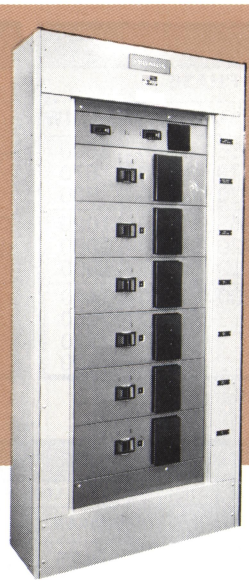
SCHEDULE PB-2 DISCOUNTS

NOTE: See page 14 for Layout Data.

TYPE CBC-X CONVERTIBLE SWITCHBOARDS

MAIN BUS TO 4000 AMPERES TO 600 VOLTS A.C. — 250 VOLTS D.C.

Combine Fusematic with Standard & High I.C. Molded Case Breakers in the same Switchboard



TYPE CBC-X

The Type CBC-X Section is the newest addition to the Sylvania Uni-Form'd Switchboard Line. Although basically designed for the installation of Fusematic Circuit Breakers in "convertible" style arrangement, flexibility and interchangeability features will permit the installation of Standard and High Line molded case breakers in combination with the Fusematic fused devices.

Type CBC-X brings to the industry a convertible distribution switchboard with interrupting current ratings in its main and branch breakers up to 200,000 amperes symmetrical.

FEATURES FUSEMATIC CIRCUIT BREAKERS

Fusematic Breakers limit the short circuit current to a fraction of its possible value and not only clear the fault but also prevent damage to other circuit components. Circuits are protected by: time delay thermal trip; instantaneous magnetic trip; and current limiting operation to prevent development of high magnitude fault currents.

CIRCUIT BREAKER COMBINATIONS

Standard and High Line molded case breakers can be used in combination with Fusematic Breakers in the same panel. This flexibility will permit the installation of breakers ranging from 15 to 2000 amperes with interrupting ratings up to 235,000 asymmetrical or 200,000 symmetrical.

FORMED DOOR

Furnished when specified. Mounted with piano hinge — vault handle and lock. $150 list price.

DIMENSIONS						
MAIN AMPERES	INDOOR			WEATHERPROOF		
	WIDE	HIGH	DEEP	WIDE	HIGH	DEEP
200-1200	42	90	14	42	90	25
1600-2000	42	90	24	42	90	36
2500	42	90	30	42	90	42
3000	42	90	36	42	90	48
4000	42	90	48	42	90	60

AVAILABLE PANEL SPACE

Switches, breakers and motor control units are dimensioned to the same "X" height multiple to permit interchangeability and to provide for easy future additions or changes in the field. The table below indicates the available panel space for devices. If the "X" units required exceed these figures, two or more sections must be used.

SECTION X SPACE

Western Utility Designs — 44X maximum

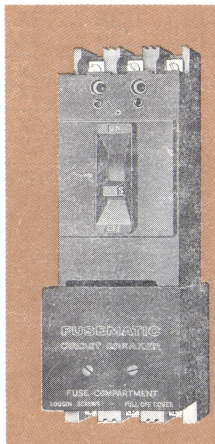
AMPERE RATING MAIN BUS	DISTRIBUTION SECTION POWER INPUT(1)			
	MAIN LUGS(2)		MAIN SW/CB OR CROSS-BUS(3)	
	W/NEUTRAL	NO NEUTRAL	W/NEUTRAL	NO NEUTRAL
400	46	48	47	49
600	45	47	47	49
800	45	47	47	49
1000	39	44	44	49
1200	39	44	44	49
1600	31	39	41	49
2000	31	39	41	49
2500	(4)	(4)	(4)	49
3000	(4)	(4)	(4)	49
4000	(4)	(4)	(4)	49

(1) Front accessibility only. If rear is accessible, 49X units available for all types.

(2) Using standard screw-type lugs, if compression (or crimp) type lugs are required, deduct 3X from available space thru 1200 Amp, and 6X for 1600A and 2000A ratings.

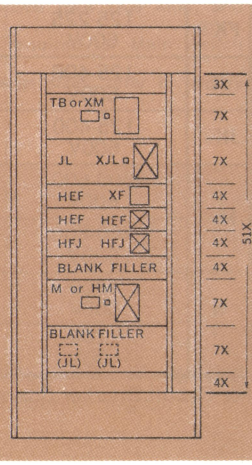
(3) Figure does not include "X" unit height required for Main Switch or Circuit Breaker.

(4) Front accessibility only not practical on large sizes, refer to factory for available space.



FUSEMATIC CIRCUIT BREAKERS

LAYOUT OF TYPICAL CBC-X ASSEMBLY



BASE LIST PRICE①

AMPERE RATING	PHASE			
	1∅, 2W	1∅, 3W	3∅, 3W	3∅, 4W
400	$725	$780	$810	$865
600	775	840	875	940
800	950	1020	1050	1120
1000	1065	1160	1215	1310
1200	1090	1200	1215	1310
1600	1310	1440	1490	1620
2000	1420	1560	1620	1760
2500	....	....	2300	2410
3000	....	....	2450	2680
4000	....	....	2900	3190

① Use once per Section.

ADDITIONAL FEATURES

ITEM	PHASE	AMPERE RATING OF MAINS									
		200	400	600	800	1200	1600	2000	2500	3000	4000
SPLIT BUS	1∅	$ 78	$ 97	$110	$146	$183	$248	$280			
	3∅	97	110	121	164	206	285	316	$400	$431	$546
GROUND BUS	ANY	152	152	152	152	152	152	152	152	152	152
WEATHERPROOFING: 1ST SECTION		487	487	487	487	487	487	487	728	728	1582
ADD'L SECTION		367	367	367	367	367	367	367	516	516	1215

CBC-X MAIN OR BRANCH CURRENT LIMITING BREAKERS

TYPE	AMPERES RATING	POLES	LIST PRICE			HEIGHT	NEMA INTERRUPTING RATINGS SYMMETRICAL AMPERES A.C.	FED. SPECS. W-C-375A CLASS
			BREAKER	SPACE	FUTURE PROV.		600 VOLT	
XF②	15-100	2	$ 578	$ 26	$ 36	4X	200,000	2e
		3	729	26	50	4X		
XJL	125-225	2	1166	84	110	7X	200,000	3c
		3	1458	84	146	7X		
	250-400	2	1312	84	110	7X	200,000	4a
		3	1670	84	146	7X		
XM	125-600	2	1842	84	134	7X	100,000	6
		3	2272	84	176	7X		
	700-800	2	2430	84	164	7X	100,000	6
		3	3159	84	212	7X		
CP③	1000-1600	2	5163	311	460	24X	200,000	6
		3	6258	311	586	24X		
CR③	1800-2000	2	6258	311	460	24X	200,000	6
		3	6621	311	586	24X		

③ Vertically mounted only. ② Breakers can be mounted side by side; others single mounting only.

LAYOUT DATA

List voltage, ampere rating and phase of the service. Specify whether Main Lugs Only or Main Circuit Breaker and rating of main bus.

To Base List Price, add price of Main Breaker (when required) and Branch Breakers. Fusematic Type Breakers can be combined with High Interrupting Capacity molded case Breakers and with Standard molded case Breakers in the same Type CBC-X Switchboard Section. Refer to page 33 for molded case breaker listing. Add Spaces, Future Provisions and Special Features. Total will show price of switchboard.

If total panel height needed exceeds the available space, another section must be ordered and price of horizontal bussing added.

CBC-X EXAMPLE

277/480 VOLTS — 30, 4W, S/N

	SN		
7X	XM 600A-3P		600A-3P XM $2272
7X	JL 400A-3P	XJL 225A-3P	JL 400A-3P @ 680; XJL 225A-3P @ $1458 2138
4X	HEF 70A-3P	XF 50A-3P	HEF 70A-3P @ 238; XF 50A-3P @ 729 967
3X	HFJ 175A-3P	HFJ 225A-3P	HFJ 175A-3P @ 838; HFJ 225A-3P @ 838 1676
4X	Space		Space for (2) XF @ 26 each 52
7X	Space		Space for (1) XJL 84
	Filler Plate		Filler Plate Height determined by unused panel space.
	Main Lugs		1200A Main Lugs Incl.

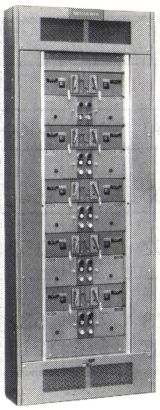
32X (39X available)

1200A Base List Price 1310

Total List Price $8499

SCHEDULE PB-2 DISCOUNTS

MOTOR CONTROL SWITCHBOARDS
MOTOR STARTERS WITH FUSIBLE SWITCHES OR BREAKERS



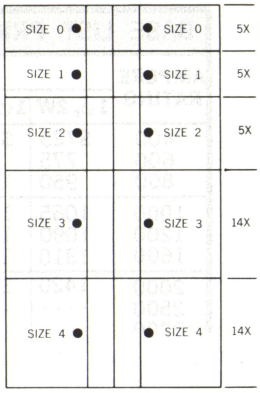
TYPE CMC

TYPE CMC-QSF

TYPE CMC-CBC

Type CMC Switchboards permit an unlimited degree of flexibility. Motor starter and fusible switch combinations, motor starter and circuit breaker combinations, fusible switch branch feeders and circuit breaker branch feeders can be combined or interchanged. Enclosures containing relays, time switches, transformers and other control devices can also be included in the arrangement. Each motor starter is housed in an individual enclosure installed directly below its fusible switch or circuit breaker disconnect. A mechanical interlock prevents opening of cell door unless disconnect is in OFF position. Each starter factory wired to its disconnect device and provided with an external reset button in its door. Motor control units, switches and breakers dimensioned to the same "X" height multiple for convertibility and interchangeability.

For total "X" units available, refer to Page 30 for Type QSF and Pages 32 and 34 for Type CBC structures.



MOTOR CONTROL CELL HEIGHTS

REFER TO PAGE 19 FOR ACCESSORIES

BASE LIST PRICE①

AMPERE RATING	PHASE			
	1∅, 2W	1∅, 3W	3∅, 3W	3∅, 4W
400	$455	$515	$540	$600
600	510	570	610	670
800	660	720	760	820
1000	770	865	920	1020
1200	810	920	970	1080
1600	980	1110	1170	1300
2000	1090	1230	1300	1440
2500	....	....	1850	2050
3000	....	....	2100	2320
4000	....	....	2530	2800

① Use once per Section.

ADDITIONAL FEATURES

ITEM	PHASE	AMPERE RATING OF MAINS									
		200	400	600	800	1200	1600	2000	2500	3000	4000
SPLIT BUS	1∅	$ 78	$ 97	$110	$146	$183	$248	$280			
	3∅	97	110	121	164	206	285	316	$400	$431	$546
GROUND BUS	ANY	152	152	152	152	152	152	152	152	152	152
WEATHERPROOFING: 1ST SECTION		487	487	487	487	487	487	487	728	728	1582
ADD'L SECTION		367	367	367	367	367	367	367	516	516	1215

STARTER UNITS (DISCONNECT NOT INCLUDED IN LIST PRICE)

NEMA STARTER SIZE		STARTER HORSEPOWER						LIST PRICE STARTERS 3RD O.L. INCLUDED		HEIGHT X UNITS	MAX. FUSES AMP RATING (TIME DELAY)		MAX. CIRCUIT BREAKER AMP RATING			
		200V		230V		460V							208-230V		460V	
LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT	WIRED	FUTURE PROV.		LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT	LEFT UNIT	RIGHT UNIT
3 POLE ACROSS THE LINE STARTER UNITS																
0	.	3	..	3	..	5	..	$ 256	$ 97	5X	30	....	20	....	20	....
0	0	3	3	3	3	5	5	395	97	5X	30	30	20	20	20	20
1	.	7½	..	7½	..	10	..	274	97	5X	30	....	50	....	30	....
1	0	7½	3	7½	3	10	5	426	97	5X	30	30	50	20	30	20
1	1			7½	7½	10	10	456	97	5X	30	30	50	50	30	30
2	.	10	..	15	..	25	..	389	122	5X	60	....	100	....	70	....
2	0	10	3	15	3	25	5	493	122	5X	60	30	100	20	70	20
2	1	10	7½	15	7½	25	10	546	122	5X	60	30	100	50	70	30
2	2	10	10	15	15	25	25	632	122	5X	60	60	100	100	70	70
3	.	25	..	30	..	50	..	742	201	14X	100	....	125	....	125	....
3	2	25	10	30	15	50	25	1099	201	14X	100	60	125	100	125	70
3	3	25	25	30	30	50	50	1112	201	14X	100	100	125	125	125	125
4	.	40	..	50	..	100	..	1239	201	14X	200	....	225	....	225	....
4	2	40	10	50	15	100	25	1531	201	14X	200	60	225	70	225	70
4	3	40	25	50	30	100	50	1701	201	14X	200	100	225	125	225	125
4	4	40	40	50	50	100	100	2127	201	14X	200	200	225	225	225	225
3 POLE REVERSING STARTER UNITS — SINGLE UNITS																
0		3		3		5		478	122	8X	30		20		20	
1		7½		7½		10		504	122	8X	30		50		30	
2		10		15		25		753	122	8X	60		100		70	
3		25		30		50		1166	201	14X	100		125		125	
3 POLE PART WINDING STARTER UNITS — SINGLE UNITS																
2PW		20		25		40		1093	122	8X	200		125		125	
3PW		40		50		75		1688	201	14X	200		225		225	
4PW		75		75		150		3189	201	14X	400		400		400	

SCHEDULE PB-2 DISCOUNTS

QSF — MAIN OR BRANCH SWITCHES

VOLTS	AMPERE RATING	CATALOG NO.	LIST PRICE SWITCH	LIST PRICE SPACE	HEIGHT	HORSEPOWER RATING N.E.C. STD.	TIME DELAY FUSES 240V	480V	600V
240 VOLTS 2 POLE	30/30	QSF-T332B	$ 104	$ 49	4X	1½	3	...	...
	60/60	QSF-T632B	104	49	4X	3	10	...	...
	100/100	QSF-T1032B	158	49	4X	7½	15	...	...
	100	QSF-1032B	85	49	4X	7½	15	...	...
	200	QSF-2032B	188	85	7X	15	...	...	...
	400	QSF-4032	413	134	11X	...	...	...	...
	600	QSF-6032	644	134	11X	...	...	...	...
240 VOLTS 3 POLE	30/30	QSF-T333B	139	49	4X	3	7½	...	...
	60/60	QSF-T633B	139	49	4X	7½	15	...	...
	100/100	QSF-T1033B	194	49	4X	15	30	...	...
	100	QSF-1033B	109	49	4X	15	30	...	...
	200	QSF-2033B	267	85	7X	25	...	...	...
	400	QSF-4033	608	134	11X	50	100	...	...
	600	QSF-6033	850	134	11X	75	100	...	...
480 & 600 VOLTS 2 POLE	30/30	QSF-T352B	152	49	4X	3	...	7½	10
	60/60	QSF-T652B	152	49	4X	5	...	20	25
	100	QSF-1052B	116	60	5X	10	...	...	40
	200	QSF-2052B	256	85	7X	...	...	...	50
	400	QSF-4052	571	134	11X	...	...	...	...
	600	QSF-6052	742	134	11X	...	...	...	...
480 & 600 VOLTS 3 POLE	30/30	QSF-T353B	183	49	4X	5	...	15	20
	60/60	QSF-T653B	183	49	4X	15	...	30	50
	100	QSF-1053B	146	60	5X	25	...	50	50
	200	QSF-2053B	340	85	7X	60	...	100	100
	400	QSF-4053	784	134	11X	100	...	250	350
	600	QSF-6053	935	134	11X	100	...	400	500

MAIN OR BRANCH BREAKERS

TYPE	AMPERE RATING	POLES	LIST PRICE BREAKER	LIST PRICE SPACE	LIST PRICE FUTURE PROV	HEIGHT
QB	15-50 • 120/240V	1	$25	$ 7	$ 13	①
	② 15-30 • 277V	1	37	7	13	
	60 • 120/240V	2	50	13	22	2X
	60 • 240V	2	58	13	22	2X
	70 • 240V	2	73	13	22	2X
	100 • 240V	2	80	13	22	2X
	15-50 • 240V	3	80	13	22	2X
	70 • 240V	3	90	13	22	2X
	100 • 240V	3	102	13	22	2X
E	15-50 240V	1	35	7	13	①
		2	64	19	26	3X
		3	95	19	30	3X
	70-100 240V	2	94	19	26	3X
		3	122	19	30	3X
EF②	15-50 • 277V	1	39	7	13	①
EF	15-50 480V	2	104	19	26	3X
		3	134	19	30	3X
	70-100 480V	2	134	19	26	3X
		3	158	19	30	3X
	15-50 600V	2	119	19	26	3X
		3	158	19	30	3X
	70-100 600V	2	146	19	26	3X
		3	183	19	30	3X
QFB	125-225 240V	2	194	19	36	3X
		3	248	26	50	4X
QL	250-400 240V	2	486	26	56	4X⑤
		3	608	39	78	6X⑤
	500-600 240V	2	789	52	98	4X⑤
		3	1032	78	134	6X⑤
FJ	70-225 600V	2	316	19	36	3X
		3	395	19	50	3X
FK③	125-225 600V	2	395	19	36	3X
		3	462	19	50	3X
JL	125-400 600V	2	565	39	56	6X
		3	680	39	78	6X

TYPE	AMPERE RATING	POLES	LIST PRICE BREAKER	LIST PRICE SPACE	LIST PRICE FUTURE PROV	HEIGHT
JK①	125-400 600V	2	620	39	56	6X
		3	766	39	78	6X
M③	500-600 600V	2	948	78	98	6X
		3	1190	78	134	6X
	700-800 600V	2	1239	78	127	6X
		3	1567	78	170	6X
N ③	1000 600V	2	1652	78	188	6X
		3	1981	78	256	6X
	1200 600V	2	2406	78	188	6X
		3	2733	78	256	6X

MAIN OR BRANCH HIGH I.C. BREAKERS

TYPE	AMPERE RATING	POLES	LIST PRICE BREAKER	LIST PRICE SPACE	LIST PRICE FUTURE PROV	HEIGHT
HEF	② 15-50 • 277V	1	$ 78	$ 7	$ 13	①
	15-50 • 600V	2	183	19	26	3X
		3	213	19	30	3X
	70-100 600V	2	201	19	26	3X
		3	238	19	30	3X
HFJ	70-225 600V	2	692	19	36	3X
		3	838	19	50	3X
HJL	125-400 600V	2	935	39	56	6X
		3	1142	39	78	6X
HM ③	500-600 600V	2	1191	78	98	6X
		3	1456	78	134	6X
	800 600V	2	1518	78	127	6X
		3	1871	78	170	6X
HN ③	1000 600V	2	1907	78	188	6X
		3	2224	78	256	6X
	1200 600V	2	2613	78	188	6X
		3	2856	78	256	6X

②For 277/480 Volts, 3Ø, 4W, SN. ③With Interchangeable Trip. ④See page 14 for Space Heights. ⑤8X spaces required when used as main.

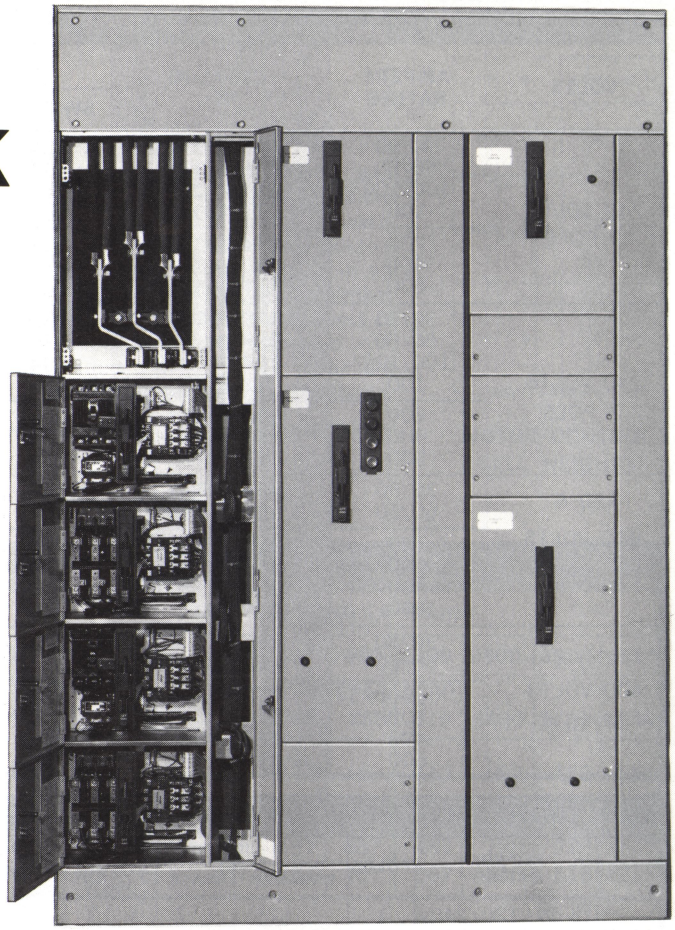
Sylvania Clark™ SuperCenter

A new breed of Motor Control Center with more exclusive PLUS benefits than any other.

SuperCenters are used to provide a centralized grouping of motor controls. Applications include:

- Air conditioning systems for stores and apartments
- Industrial plant area control
- A given machine or process
- A finite section or portion of a large process

Are these benefits important to you?



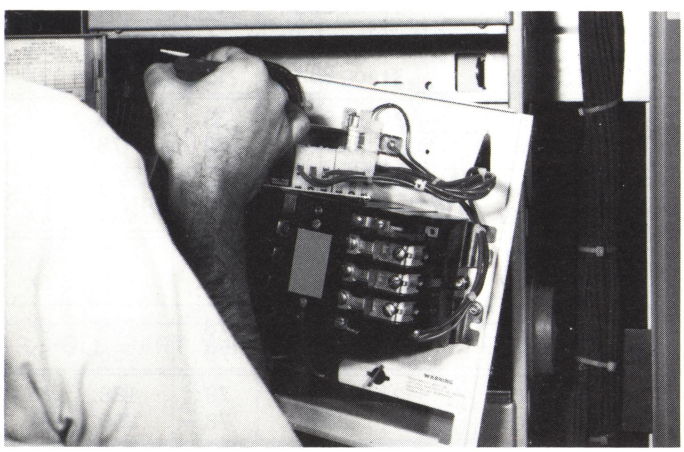
TYPICAL 3-VERTICAL SUPERCENTER

Each SuperCenter consists of one or more vertical sections each 90″ tall, 20″ wide and 20″ deep. Since only eighteen inches of height is required for horizontal wireways, the remaining 72″ in each section is available for control units which are a minimum of 12″ in height. Thus up to 6 control units can be furnished per section for front mounting centers but this capability can be doubled when front and rear mounting is specified.

Each control unit required simply "plugs-in" the vertical bus. Positive operation of the Power Plug assures reliable electrical plug-in connection, holding maintenance costs at a minimum.

The incoming line connection unit, located at either top or bottom is completely isolated and no cable bending is required. Installation costs and time are reduced, while increasing safety for your personnel.

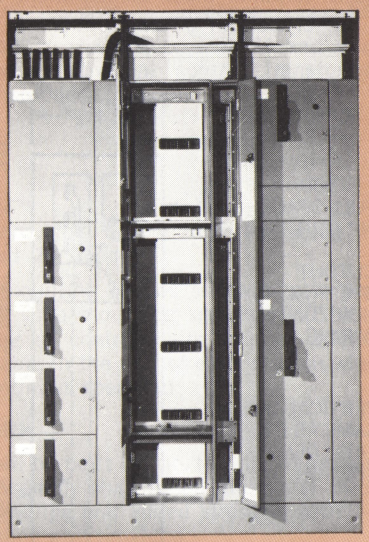
Installation of Starter in SC Compartment



- Preventative maintenance is simplified and encouraged because all control equipment is housed in a single location.
- A minimum amount of area is required and control may be installed in what might otherwise be an unused area.
- Expansion space for future controls can be provided in advance or additional SuperCenters can easily be added to existing ones without altering the appearance or continuity of the installation.

MOTOR CONTROL CENTER

Every industrial plant is becoming more and more conscious of safety and is insisting on not only a high level of reliability and convenience, but also a high level of safety. Visibility is a major safety factor and the Sylvania SuperCenter is designed for not only reliability and convenience, but also to let men clearly see what they are doing.



Isolation Bus — showing doors open

All horizontal and vertical busses are completely enclosed in a unique steel isolation system. — A rugged, durable means of providing safety for your personnel.

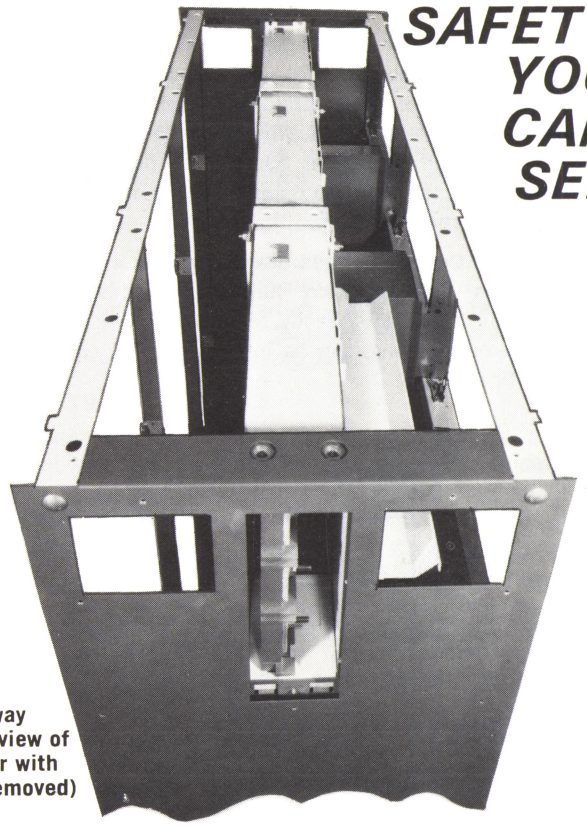
The unique steel isolation system is an integral part of the basic structure with no panels, covers or sheet metal fasteners subject to removal or improper replacement. —Reliable safety is provided for your personnel.

Bus supports, the bus configurations and the unique steel isolation system combine to provide outstandingly reliable bracing against short circuit stress. — This strength reduces costly repairs and lost production in event of short circuit.

11-gauge tie angles run the entire length of each assembly, front and rear, top and bottom. This rigidity plus a full length lifting T-bar eases handling. — Your risk of costly damage during installation is minimized.

Convenient, visible isolation of the unit from power is provided by the Power Plug, which is easily pulled or plugged in without disturbing the unit. — "Safety you can see," without increasing downtime.

SAFETY YOU CAN SEE



Wireway (End view of center with top removed)

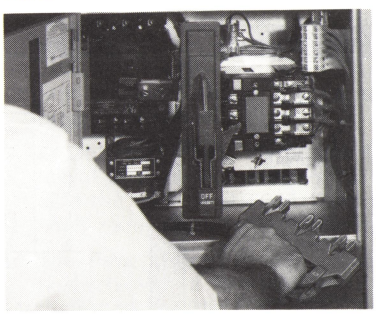
SuperCenter's "safety you can see" combined with its designed reliability and flexibility satisfies almost everyone's need.

- A full 18 inches of horizontal wireways (6″ and 12″) is provided. At your option, the 12″ wireway is located at top or bottom. — Wiring space where you need it reduces your installation cost and time.

- An isolated, full length, vertical wireway with its own door is provided for each vertical section. Wiring may be added or changed without shutting down live units. — You stay in production, with safety.

- The absence of front-to-rear bracing between vertical sections provides more conduit entry space. — Conduits enter near their associated control, thus reducing your installation cost and time.

- Even when mounted against a wall, the rear conduit entry areas are accessible from the front and cables may be brought forward through the vertical or horizontal wireways. — Generous wiring and conduit space cuts your installation cost and time.



Starter compartment of SuperCenter with Power Plug disengaged

- A simple interlock is designed to prevent removal or insertion of the Power Plug unless the unit disconnect operator is in the "OFF" position. — An added safety feature for the protection of your personnel.

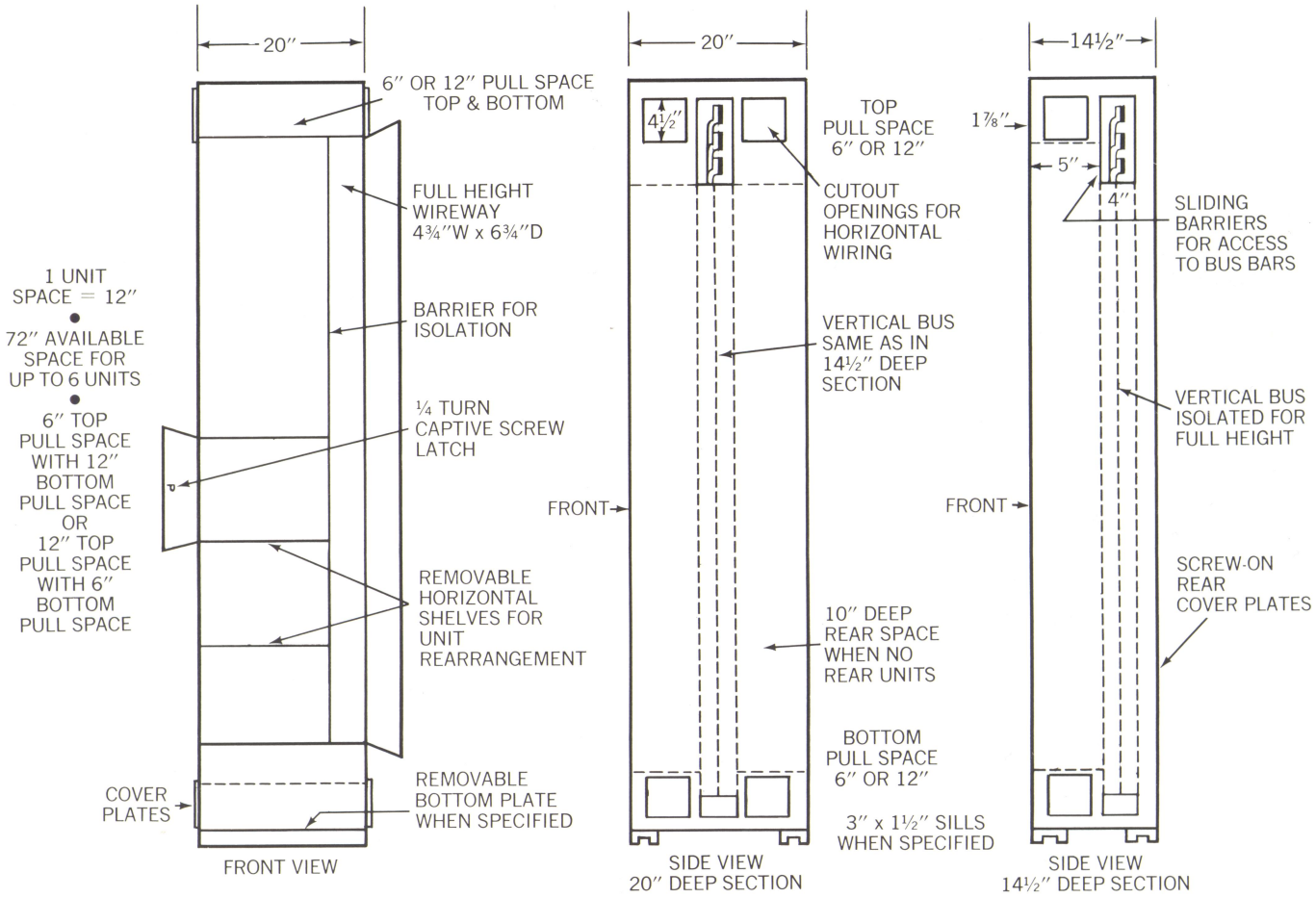
TYPE SC DIMENSIONS

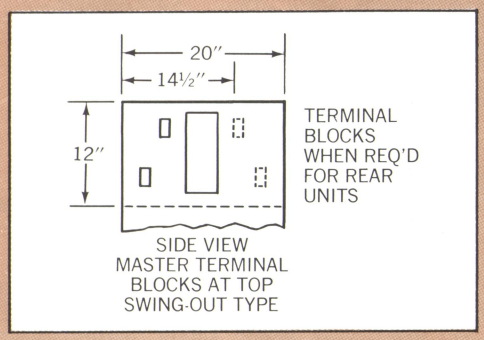
Sylvania Type SC Motor Control Section is a factory assembled, floor standing switchboard that centralizes in one unit the equipment needed for the control of a number of motors. Sections can be installed individually or can be joined together, interconnected with horizontal bussing, to provide in a minimum space a motor control center to accommodate future as well as current requirements.

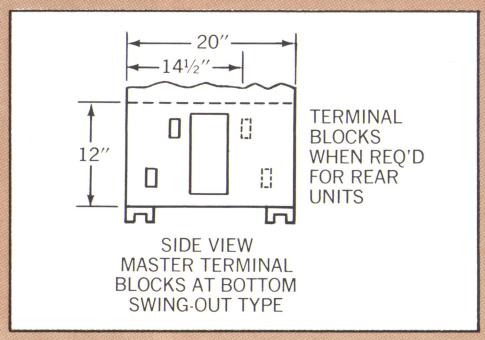
Type SC Motor Control Centers are assembled in standardized basic sections and maintain fundamental design features throughout the line. Units, easily removable or replaceable for maintenance or servicing, can be interchanged to conform with plant modifications.

Each section is 20″ wide and 90″ high. Standard sections are 20″ deep — front mounting only or front & rear mounting. Optional 14½″ deep sections are available for front mounting only. 4″ high lifting angles are standard.

In addition to its motor control units, each section contains a 6″ high compartment for horizontal wiring and a 12″ high compartment for horizontal wiring and master terminal blocks. Master terminal blocks are factory installed in Type C sections. The master terminal block compartment can be located at either the top or bottom of the section.


20″
6″ OR 12″ PULL SPACE TOP & BOTTOM
FULL HEIGHT WIREWAY 4¾″W x 6¾″D
BARRIER FOR ISOLATION
¼ TURN CAPTIVE SCREW LATCH
REMOVABLE HORIZONTAL SHELVES FOR UNIT REARRANGEMENT
REMOVABLE BOTTOM PLATE WHEN SPECIFIED
COVER PLATES
1 UNIT SPACE = 12″
72″ AVAILABLE SPACE FOR UP TO 6 UNITS
6″ TOP PULL SPACE WITH 12″ BOTTOM PULL SPACE OR 12″ TOP PULL SPACE WITH 6″ BOTTOM PULL SPACE
FRONT VIEW
20″
4½″
TOP PULL SPACE 6″ OR 12″
CUTOUT OPENINGS FOR HORIZONTAL WIRING
VERTICAL BUS SAME AS IN 14½″ DEEP SECTION
FRONT
10″ DEEP REAR SPACE WHEN NO REAR UNITS
BOTTOM PULL SPACE 6″ OR 12″
3″ x 1½″ SILLS WHEN SPECIFIED
SIDE VIEW 20″ DEEP SECTION
14½″
1⅞″
5″
4″
SLIDING BARRIERS FOR ACCESS TO BUS BARS
VERTICAL BUS ISOLATED FOR FULL HEIGHT
FRONT
SCREW-ON REAR COVER PLATES
SIDE VIEW 14½″ DEEP SECTION





Sections can be assembled in a straight line, L shaped, back-to-back, or U shaped arrangement. Corner section available. 14½″ and 20″ deep section can be joined for front line-up.

AVERAGE WEIGHT PER SECTION

Front mounted units only— 400 pounds.

GENERAL SPECIFICATIONS

Motor Control Centers shall be Sylvania Bulletin 6200, Type SC, engineered and manufactured to meet or exceed applicable NEMA and UL specifications.

The enclosure shall be NEMA (1) (1 gasketed) (12) (3R non walk-in) (3R walk-in).

Motor starters shall be (circuit breaker) (fusible switch) type combination units.

Units shall be mounted (front only) (front and rear) in the motor control center structure.

Wiring shall be NEMA Class (I) (II) Type (A) (B) (C).

Center shall be suitable for operation on:
_____volts, _____wire, _____phase, _____hertz.

The control voltage shall be _____volts and source shall be (line voltage) (individual control transformers) (master control transformer) (remote).

STRUCTURE

DIMENSIONS —

Vertical sections shall be 90″ high excluding lifting angles, 20″ deep, and 20″ wide.

Control unit mounting spaces shall be a minimum of 12″ in height. Six such mounting spaces shall be provided for front mounting of control units and six additional spaces shall be available in the rear of each section when both front and rear mounting is specified.

CONSTRUCTION —

Structures shall be built in one, two and three vertical assemblies. Each assembly shall be an individual shipping section for ease of handling and added strength, with T-Bar (for lifting) and shipping skid provided.

Two 5/8″ diameter holes in the angle frame of each vertical section will permit the use of 1/2″ anchor bolts in securing the assembly to the floor. Motor control center(s) shall permit future additions of vertical sections and changes of units by the user.

WIREWAYS —

A total of 18″ of structure height shall be provided as horizontal wireway space. A 12″ high wireway shall be provided at the point of cable entry across the (top) (bottom) of the structure. Access to the horizontal wireways shall be provided by removable front cover plates secured with captive screwdriver operated fasteners.

Each vertical section will have a full height unobstructed vertical wireway under a separate door. The door shall be secured with 1/4-turn screwdriver operated latches. Wireway cross section shall be a minimum 4-3/4″ wide, 6-3/4″ deep.

Wireways shall be completely isolated from bus and control units and wire ties shall be furnished to secure wiring in vertical wireways.

Front to rear bracing between vertical sections within an assembly shall be eliminated to maximize conduit entry area. When the 12″ horizontal wireway is specified at the bottom of the structure there shall be no structural interference within 10″ of the floor. When control units are specified for front mounting only, rear space of the structure shall be front accessible for conduit entry and wire routing. It shall be possible to route cables forward through the bottom horizontal wireway and through the full height of the vertical wireway.

BUS SYSTEM

CONSTRUCTION —

Bus shall be aluminum and tin plated by the ALSTAN-70 process. Horizontal bus shall be continuous for the full length of the shipping section. Splice bus shall be furnished to connect shipping sections in the field. Bus connections shall be completely serviceable from the front. Connections shall be made with 3/8″ carriage bolts and conical spring washers to provide constant-pressure reliable joints.

Bus supports shall be contoured with vertical surfaces to minimize dirt buildup. Supports shall utilize high quality, track resistant, flame retardant, void free, crack resistant fiber glass filled polyester. Supports shall be colored red to warn of proximity to energized bus.

BUS RATINGS —

Horizontal bus shall be rated not less than 600 amperes. Vertical bus shall be rated not less than 300 amperes.

Bus shall be braced to withstand (22,000) (42,000) RMS symmetrical amperes.

Horizontal and vertical busses shall be protected on all sides against accidental contact. Isolation shall be provided by means of a steel barrier system built as an integral part of the basic structure and not subject to removal or improper replacement. No sheet metal fasteners shall be utilized within the bus zone. Receptacles for plug-in connections to the vertical bus shall prevent accidental contact with the bus when not in use. All bus isolation system parts shall be painted white for increased visibility.

Horizontal bus shall be located at the top of the structure to permit access to bolted connections from the top horizontal wireway. The horizontal and vertical bus system shall be on the front to rear center of the structure to permit economical use with both front and rear mounted units. Phase sequence shall be ABC top to bottom and left to right when viewed from the front of the structure.

Each motor control center shall be equipped with a ground lug. Optional (1/4″ x 1″) (1/4″ x 2″) copper ground bus can be furnished mounted in the bottom horizontal wireway.

INCOMING LINE CONNECTIONS —

If an incoming line disconnect is not specified, each motor control center shall be furnished with an incoming line connection unit located either at the top or bottom of the structure along with the 12″ horizontal wireway. Lugs shall be suitable for either copper or aluminum conductors and shall comply with NEMA spacing dimensions.

CONTROL UNITS

POWER PLUG-IN CONNECTIONS —

Plug-in clips shall be silver plated copper, designed to increase contact pressure under load or short-circuit conditions. No plug-in wiring or connections shall be hidden behind the unit mounting plate to permit visual assurance of proper plug-in alignment.

An interlock shall be provided to prevent insertion or removal of the Power Plug unless the unit disconnect operator is in the "off" position. (Dual mounted circuit breaker feeders shall require intentional operation of an interlock.)

The Power Plug can be padlocked in a visible disengaged position with a 1/4″ padlock. Unit mounting shall not be disturbed and the door will close over the isolated unit.

The Power Plug shall be polarized to provide the same phase sequence within rear mounted units as in front mounted units.

Power Plug design shall generally be available on starters through Size 4, molded case feeder breakers through 150 ampere frames and fusible switch feeders through 100 amperes. Other units may be directly connected with bolted connections to the horizontal bus.

UNIT MOUNTING —

Units shall be solidly grounded and secured in the structure prior to contact of the plug-in clips with the bus. All shall be isolated from one another by horizontal barriers which are easily removable to allow unit rearrangement in the field. Wire guards shall be provided in access openings between the units and the vertical wireway.

DISCONNECT DEVICES —

Circuit breaker combination starters shall be furnished with motor circuit protectors specifically designed for motor circuit protection in accordance with provisions of the National Electric Code. Provision shall be included to manually test the breaker's trip mechanism.

Fusible switch combination starters through size 3 shall be furnished with a fusible safety switch of visible blade construction meeting latest industry withstandability requirements. Large starters and feeders above 100 amperes shall be furnished with non-automatic circuit interruptors and separate fuse clips.

Both fusible switch and circuit breaker units shall be controlled by a vertical motion integral operating handle, color coded to indicate disconnect position. Interlocking must be defeated to open the door with the disconnect closed or close the disconnect with the door open.

Magnetic starters shall be furnished with a three-line overload relay (standard) (ambient compensated).

Starter and feeder unit doors shall be equipped with screwdriver operated quarter-turn latches that catch automatically when the door is pushed closed to insure complete closure. Blank spaces shall be covered with removable cover plates.

Each control unit shall be provided with an embossed removable-type nameplate for circuit identification with black lettering on a white background.

Control terminal boards (Type B) shall be nylon, fully shielded and 600 volt rated. They shall be mounted within the control unit up front and adjacent to the vertical wireway to facilitate inspection and circuit checkout. Starter load lugs shall serve as the power terminal board. Single space units shall accommodate 18 control terminal points. (Optional "pull-apart" control terminal boards shall be furnished.)

AUXILIARY DEVICES —

Control transformers shall be sized to handle the starter coil requirements plus two pilot lights. All units shall accommodate a 100va extra capacity transformer, without increase in space requirements. A single secondary dual element fuse shall be provided sized to protect against transformer overload. The coil side of the circuit shall be grounded to the unit mounting plate.

When pilot devices are required, the unit door shall be furnished with a cutout in which a removable plate shall be mounted with a single captive screw. The plate shall accommodate four devices for non-reversing starters and five devices for all other starter types. Pilot devices shall be heavy duty oil tight type.

FINISH

Surfaces which are painted shall first be given a phosphate coating for superior paint adhesion and corrosion resistance. Alkyd aminine enamel shall be electrostatically applied and baked thoroughly in a convection type oven to insure a long lasting, mar resistant, finish.

Painted surfaces shall be as follows: overall exterior structure — ANSI #61 Light Gray; side plates and trim — ANSI #33 Medium Dark Gray; unit mounting plates, interior structure and bus isolation system — ANSI Safety White.

All unpainted metallic parts shall be finished in cadmium or zinc/chromate to provide corrosion resistance.

WIRING

Power wiring shall be #12AWG minimum. Control wiring shall be #16 AWG minimum. Insulation shall be type MTW 90°C.

CHARACTERISTICS OF MOLDED CASE CIRCUIT BREAKERS

BREAKER TYPES	AMP RANGE	MAX. VOLTS AC	POLES	U. L. LISTED SYMMETRICAL RMS INTERRUPTING RATINGS (IN 1000s) 120/240V	240V	480V	600V	FED. SPEC. WC-375 AMEND. 3 CLASS	CU/AL LUGS AMP RANGE	CU/AL LUGS WIRE SIZE MIN.	CU/AL LUGS WIRE SIZE MAX.
QB,	15-100	120/240	1, 2	10	...	...	...	1a	15-20	14	10
									30-60	14	4
QB24		240	2, 3	10	10	...	...	1b	70-100	6	1/0
E	15-100	120/240	1	14	...	...	...	2b			
		240	2, 3	18	18	...	...	2c			
EF	15-100	277	1	14	14	...	...	2a	15-50	14	4
		480	2, 3	...	18	14	...	2d			
EF		600	2, 3	...	18	14	14	2d	70-100	6	1/0
HEF		600	2, 3	...	65	25	18	2f			
XF		600	2, 3	...	200	200	200	2e①			
QFB	125-225	120/240	2	10	...	...	...	1a	125-225	1	300MCM
		240	2, 3	10	10	...	...	1b			
FJ	70-225	600	2, 3	...	22	18	14	3a	70-225	4	300MCM
FK		600	2, 3	...	25	22	22	3b			
HFJ		600	2, 3	...	65	22	18	3d			
JL	70-400	600	2, 3	...	42	30	22	4b	70-225	4	300MCM
HJL		600	2, 3	...	65	35	22	4c			
JK		600	2, 3	...	42	30	22	4b	250-300	4	600MCM
XJL		600	2, 3	...	200	200	200	3c, 4a①	350-400	2/0 4	500MCM 250MCM
QL	250-600	240	2, 3	25	25	...	...	...	250-400 500-600 250-600	(2)250MCM (2)350MCM (1)350MCM	(2)350MCM (2)500MCM (1)800MCM
XM	125-800	600	2, 3	...	100	100	100	6①	125-400 500-600	1 (2)3/0	600MCM (2)600MCM
M	125-800	600	2, 3	...	42	30	22	5a	125-400 500-600 700-800	1 (2)3/0 (3)250MCM	600MCM (2)600MCM (3)500MCM
HM		600	2, 3	...	65	35	25	5b			
N	1000-1200	600	2, 3	...	42	30	22	...	1000 1200	(3)250MCM (4)250MCM	(3)600MCM (4)500MCM
HN		600	2, 3	...	65	35	25	...	1000 1200	(3)250MCM (4)250MCM	(3)600MCM (4)500MCM
CP	800-1600	600	2, 3	...	200	100	100	①	800-1600	(5)300MCM	(5)600MCM
NP	1600-2000	600	2, 3	...	125	85	65	...	1600 2000	(5)300MCM (6)300MCM	(5)600MCM (6)600MCM
CR	1800-2000	600	2, 3	...	200	100	100	①	1800-2000	(5)300MCM	(5)600MCM
TPSS	600-2500	600	2, 3	...	100	100	85	...	600-2500	(7)350MCM	(7)750MCM
THSS	600-2500	600	2, 3	...	200	150	100	...	600-2500	(7)350MCM	(7)750MCM
PB	600-3000	600	2, 3	...	125	85	65	...	600-3000	(4)400MCM	(4)600MCM
TPS	2500-4000	600	2, 3	...	100	100	85	...	2500-4000	(10)350MCM	(10)750MCM
THS	600-3000 4000	600	2, 3	...	200 200	150 100	100 85	...	600-4000	(10)350MCM	(10)750MCM

① This class incorporates a current-limiting fuse within the breaker case.

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Honolulu

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*Fort Wayne
Gary
Indianapolis

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Des Moines

KANSAS
Kansas City

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New Orleans

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Waltham

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Buffalo
Syracuse

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Greensboro
Raleigh

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Cincinnati
Cleveland
Columbus
Youngstown

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*Oklahoma City
Tulsa

OREGON
Portland

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Pittsburgh
Philadelphia (Wayne)

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Columbia
Greenville

TENNESSEE
Memphis
Nashville

TEXAS
Dallas
Houston
*Longview
*San Antonio

UTAH
Salt Lake City (Sandy City)

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Richmond
*Virginia Beach

WASHINGTON
Seattle

WISCONSIN
Milwaukee

NOTE: *Boxes Only

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